VOL. XXXV. No. 6 JUNE 1950

MECCANO MAGAZINE

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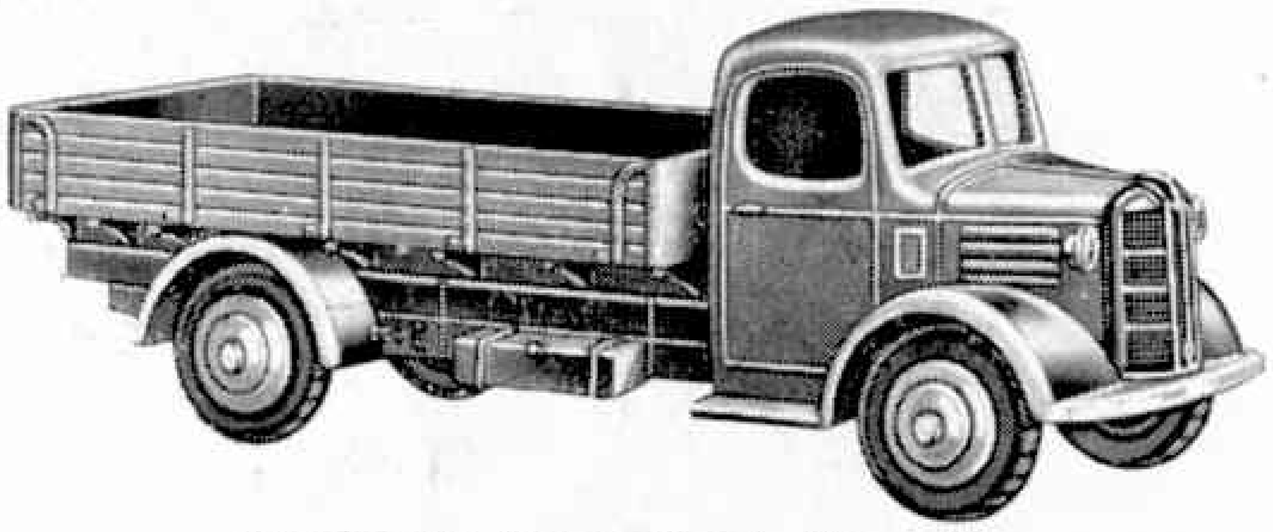

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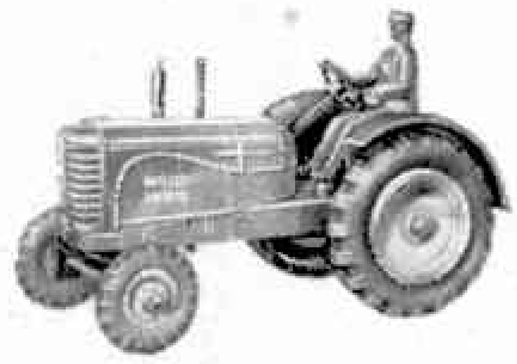

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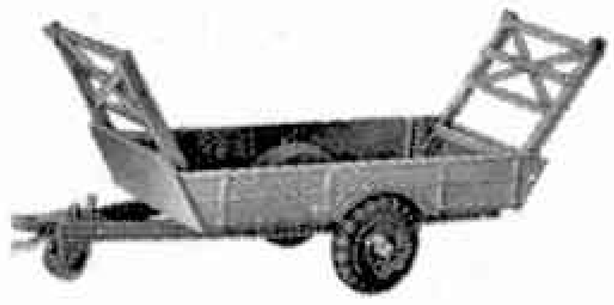

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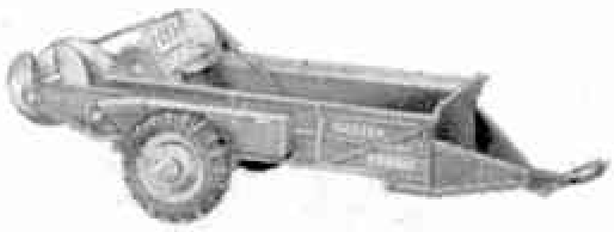

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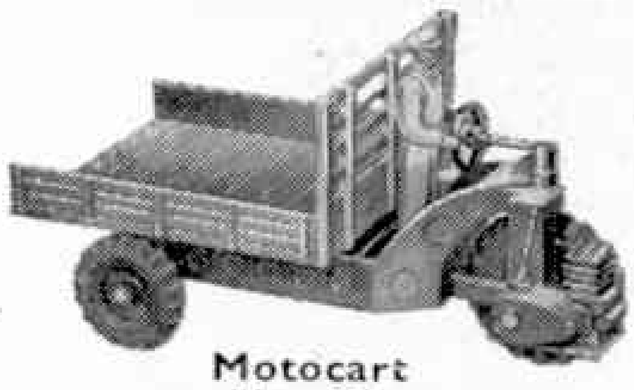

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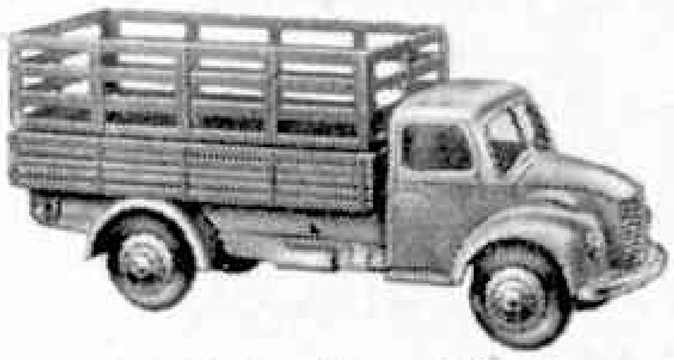

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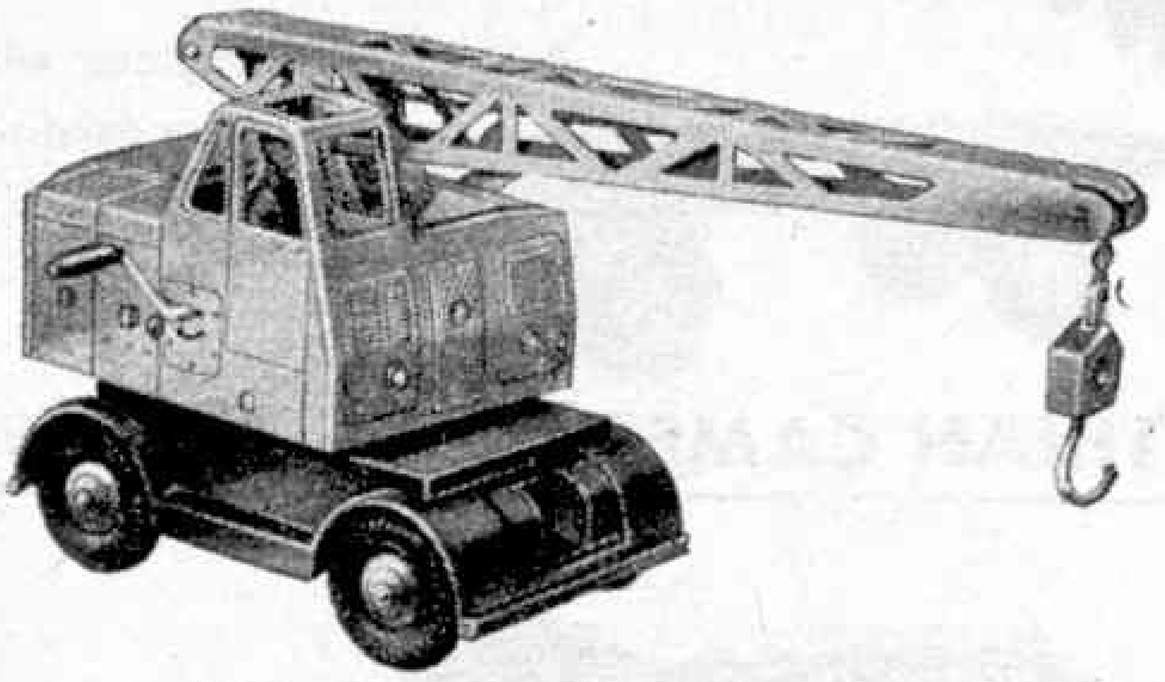

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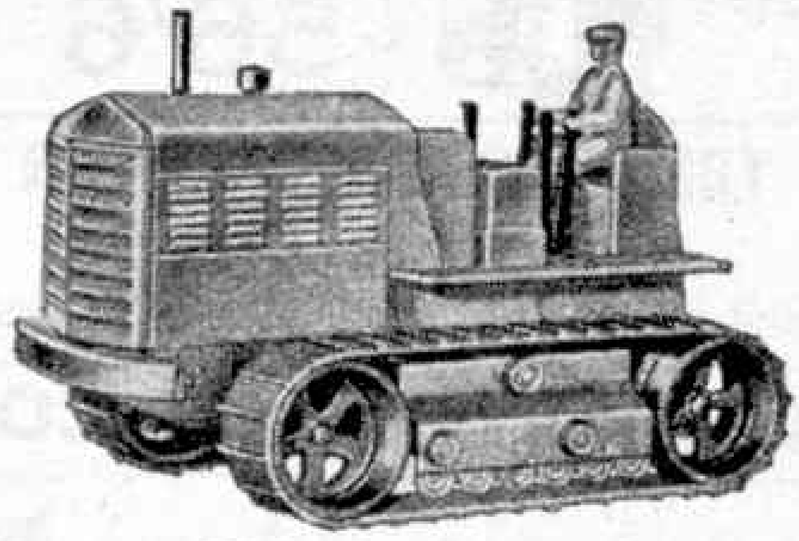

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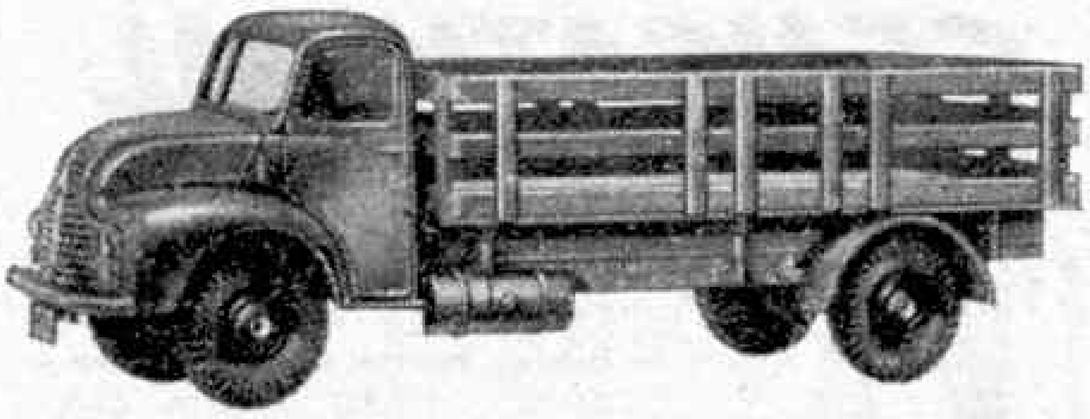

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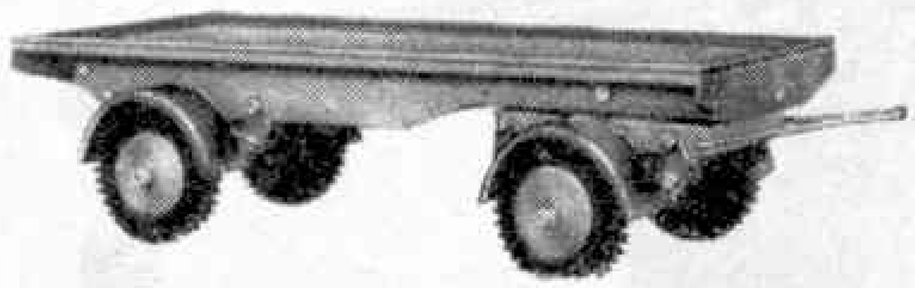

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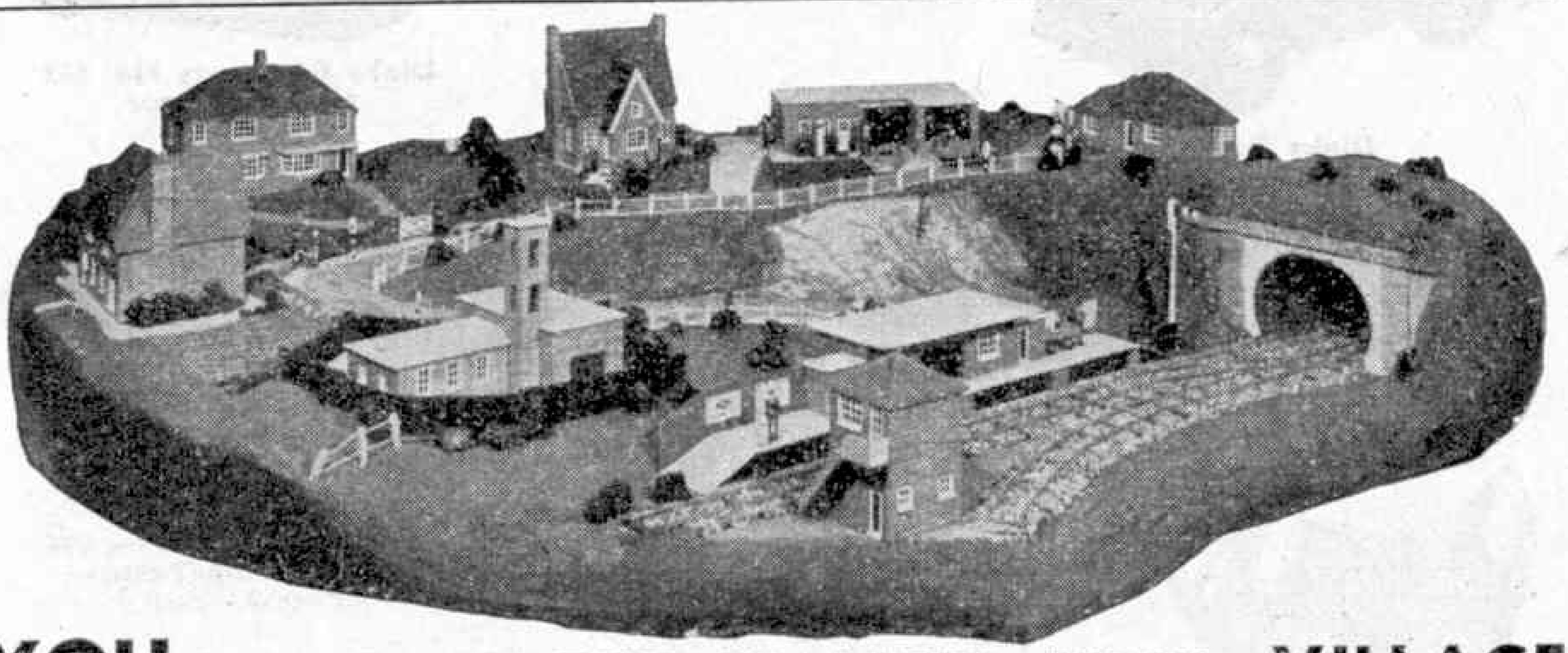

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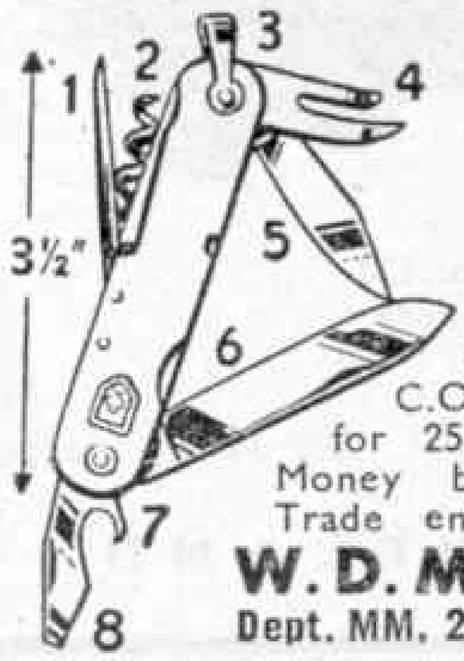

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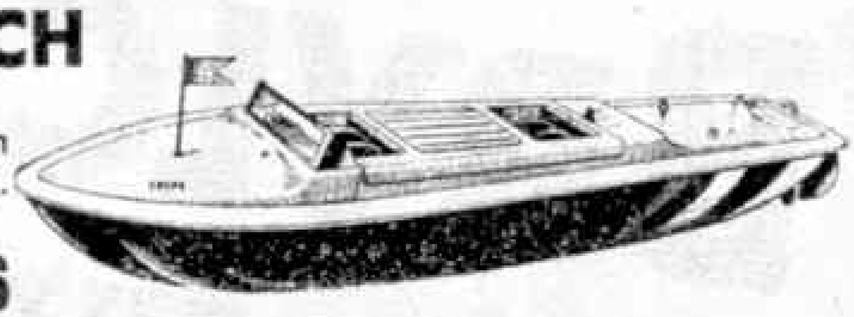

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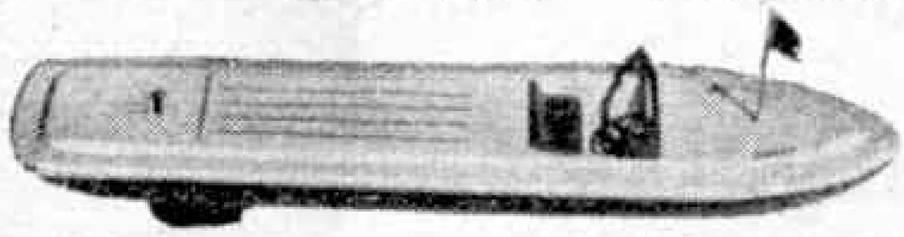

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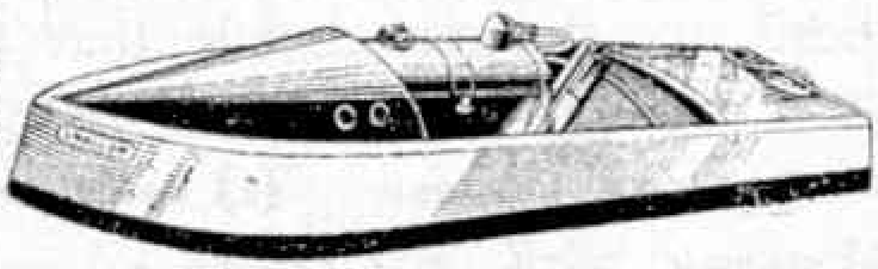

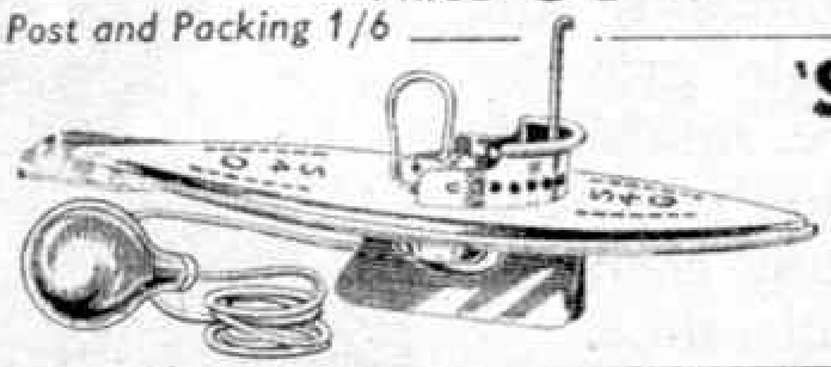

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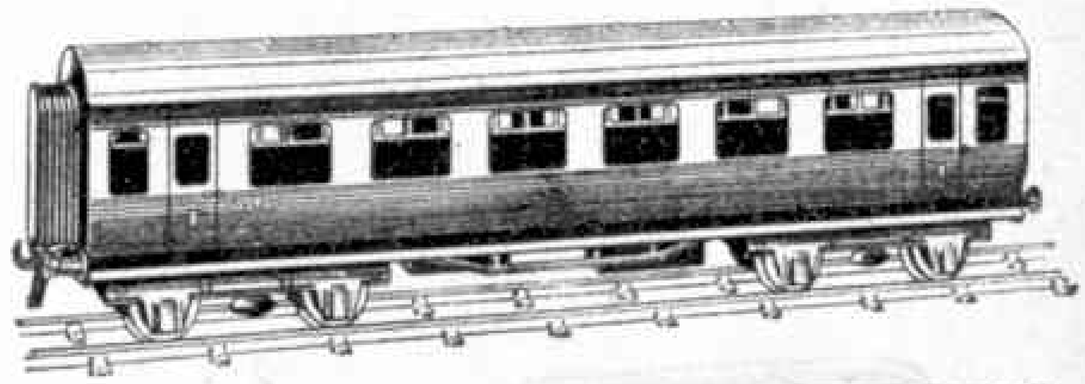

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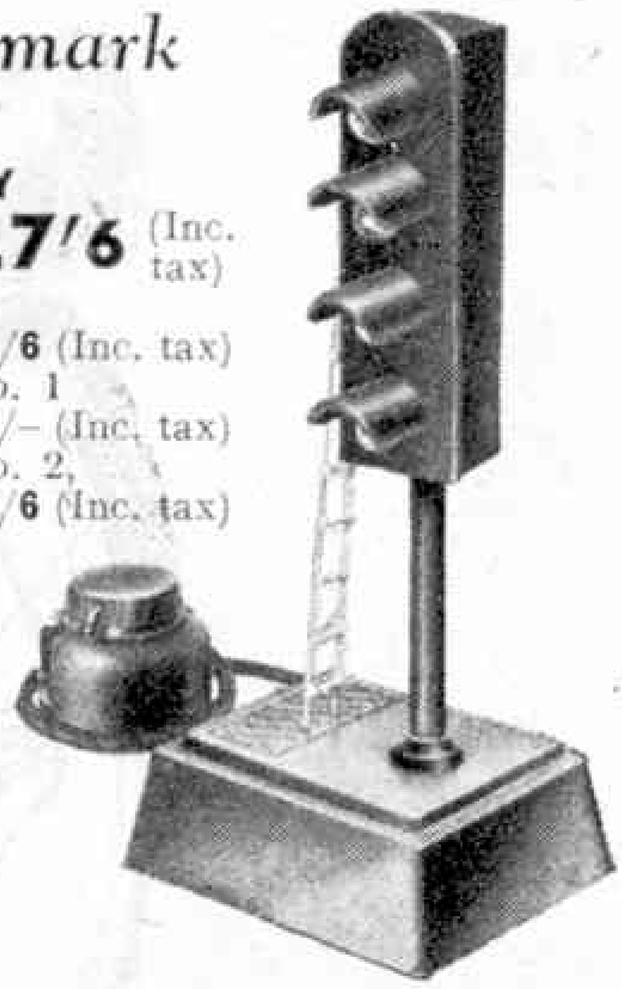

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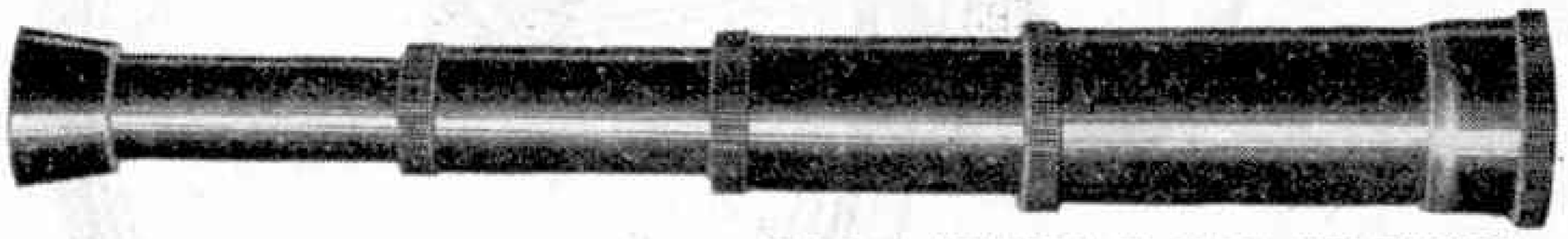

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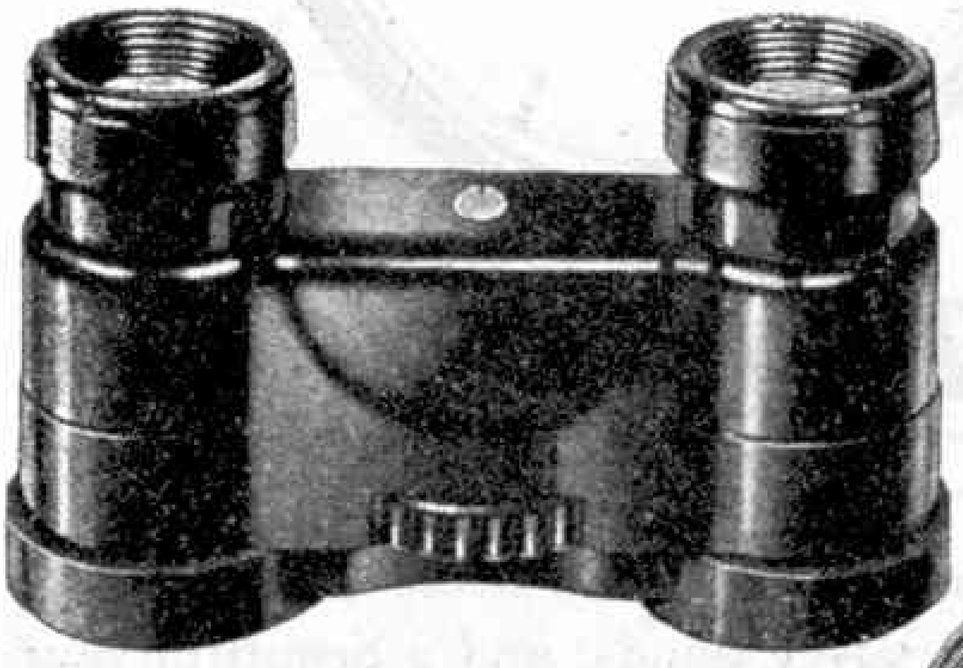

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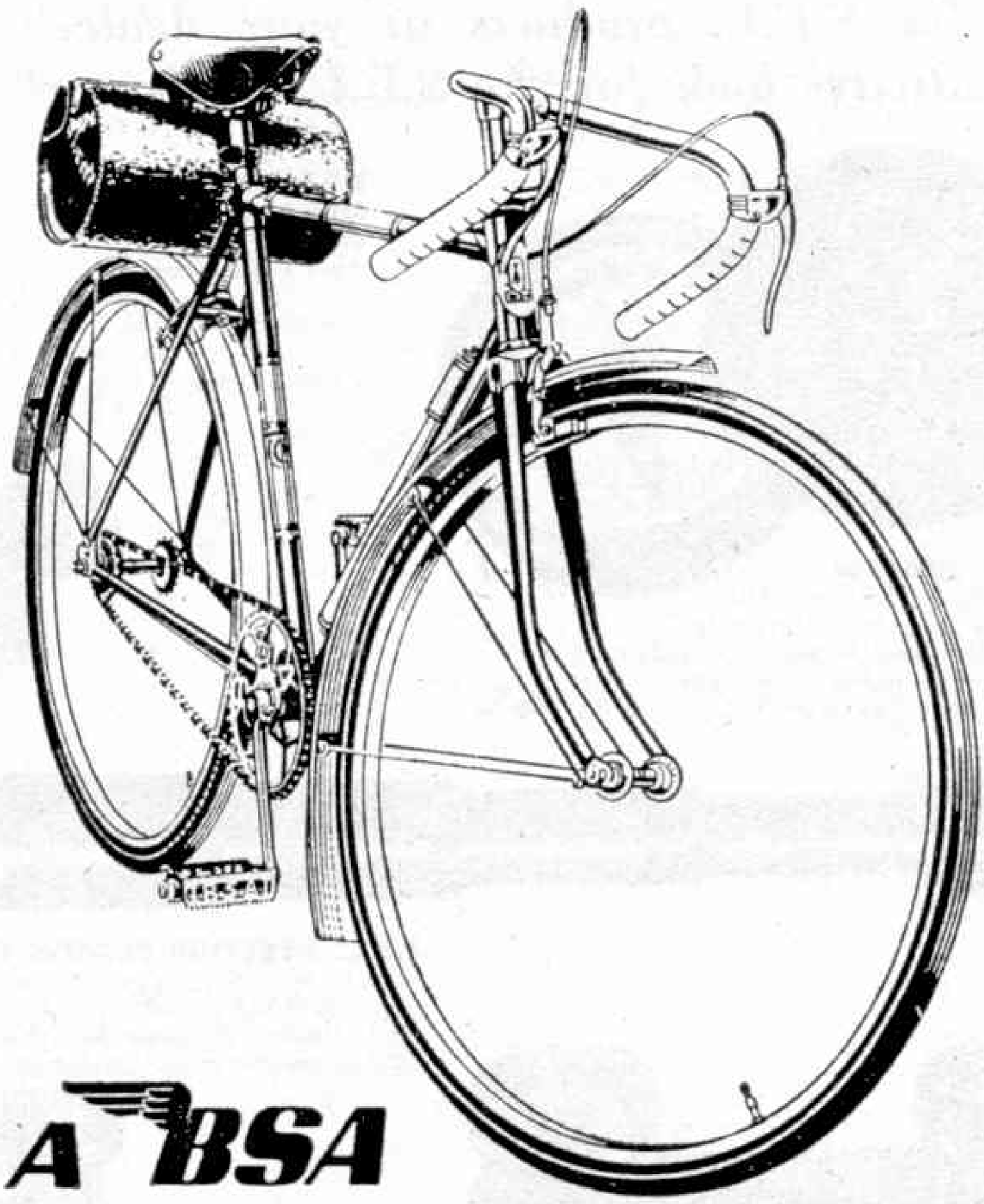

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Next Month: "DRILLING AN OIL WELL." By T. Holloway

MECCANO MAGAZINE

Editorial Offices
Binns Road
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Vol. XXXV
No. 6
June 1950

With the Editor

First Air Bus Service

British European Airways, first airline in the world to order "propjet" air liners, have given further proof of their enterprise this month by pioneering the world's first regular passenger-carrying helicopter service.

From the beginning of this month, the Corporation plan to operate two return flights daily between Cardiff and Liverpool, one of them via Wrexham, using the four-seat Sikorsky S-51s with which they have been running the world's first scheduled helicopter night mail service between Norwich and Peterborough. The new service will bring Cardiff and Liverpool within less than two hours of each other, compared with five to six hours by train and up to nine hours by road.

For the present, the helicopters will use the airports at Pengam Moor, Cardiff, and Speke, Liverpool; but as soon as B.E.A. get an efficient twin-engined helicopter they will take full advantage of the machine's unique ability to take off and alight vertically, by operating from open spaces near the centres of these and other towns. Meanwhile they will gain invaluable experience by operating the first true air 'bus service of any sort.

The new service marks an important milestone, not only in the history of the Corporation, but in the story of the helicopter itself. The first really practical helicopter flew a mere ten years ago, yet we already have helicopters able to fly at 140 m.p.h., carry three tons of freight and operate commercial services with 100 per cent. regularity. Their development has in fact been faster than that of the aeroplane in its early years, despite many formidable aerodynamic and engineering problems.

Helicopters have already achieved a great reputation for rescue, crop-spraying, flying crane, mail delivery and other work. Now for the first time they will have a chance to prove their worth as flying 'buses, able to pick up passengers anywhere, anytime, in almost any weather. The eyes of every airline operator in the world will be focussed on B.E.A.'s new venture in the next few weeks.

This Month's Contents

	Page
Trade with China .. .. .. by Frank C. Bowen	242
Renewal of Wiske Moor Water Troughs	245
World's Greatest Sculptures .. by Harold J. Shepstone, F.R.G.S.	246
Behind the Weather Forecasts .. by W. H. Owens	248
Post Office versus Woodpecker .. by David Gunston	251
Russia's New Air Force .. .. by John W. R. Taylor	254
Brock the Badger .. .. .. by R. H. Ferry, F.Z.S.	258
Shipping W.D. Locomotives at Port Said .. .. .. by D. Stewart Currie, G.I.Mech.E.	260
Photographing Aircraft .. .. by Charles E. Jackson	263
Modern Knights of the Road .. by A. Nettleton	264
Beam Engine's Long Service .. by W. R. Watson	267
Engines of Title .. .. .. by G. Lack	270

Air News, 268. Books to Read, 257. Club and Branch News, 276. Competitions Page, 285. Fireside Fun, 287. From Our Readers, 284. H.R.C. Pages, 277–9. Among the Model-Builders, 272, New Meccano Models, 274, Model-Building Competition, 275. Railway Notes, 252. Stamp Pages, 281, 283.

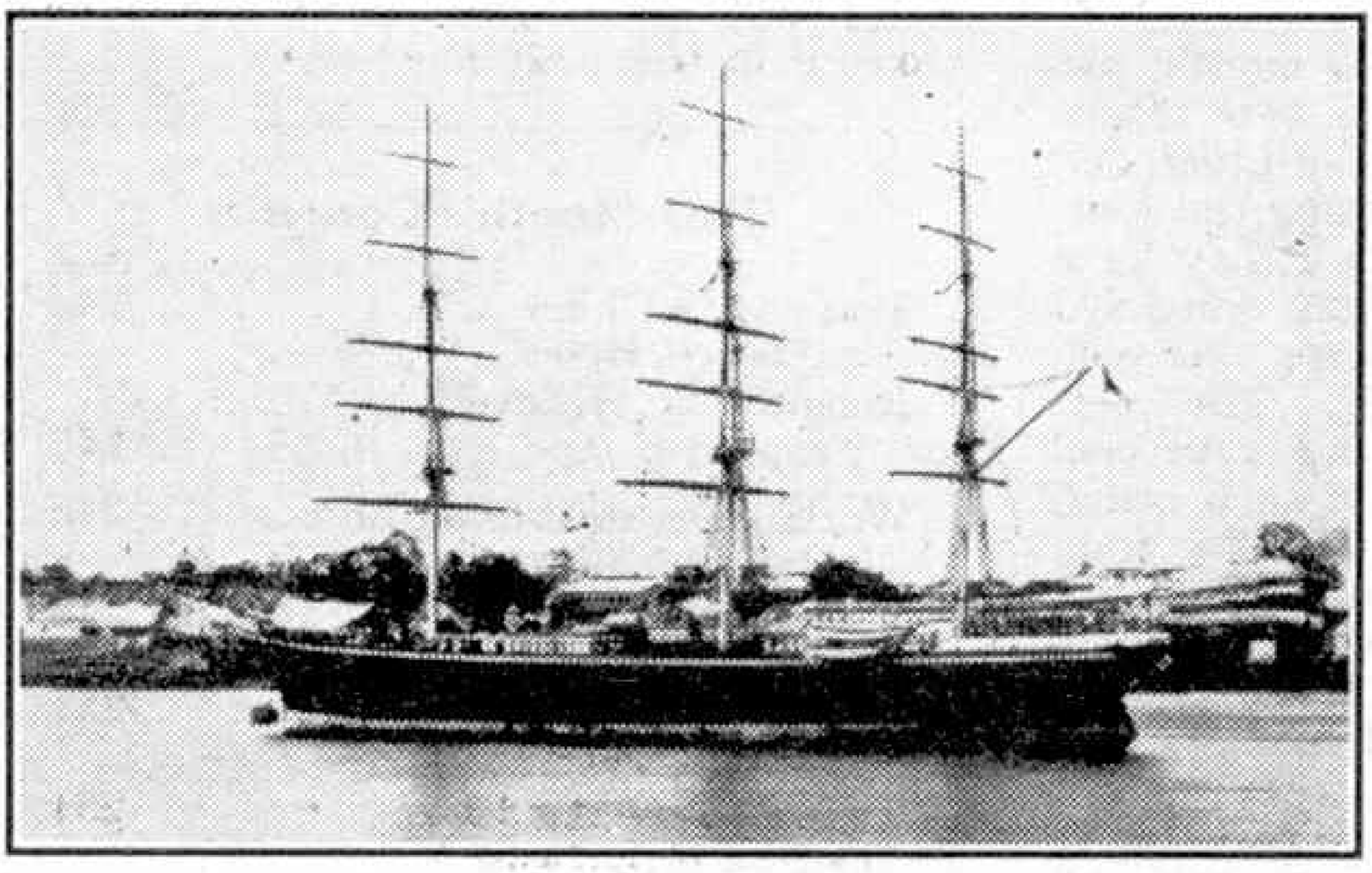
Trade with China

By Frank C. Bowen

ONE of the most interesting trades on which British ships have ever been engaged, and which British enterprise has developed, is that with China. For many years it was carried on with the best of feeling on both sides; then followed a period of quarrelling which led to war on more than one occasion, and finally the restoration of good relations and mutual respect. All through the history of the trade there has been plenty of colour, with interesting ships employed, and its future is naturally a matter of great anxiety.

The most expensive Chinese products, which were badly needed in Europe, were known in the British Isles at a very early date. The fact that they had to be carried by caravan right across Asia before they were distributed by successive Mediterranean maritime peoples—Phœnicians, Greeks, Romans and Venetians—limited the trade to silks, spices and drugs, and it was not until the middle of the seventeenth century that Britain established a trade via the Cape of Good Hope. China and all other Eastern countries were included in the monopoly granted to the East India Company, and its fighting merchantmen began to trade there regularly when the efforts to find North East and North West Passages, in order to avoid aggression and interference on the Southern routes, had failed. The Dutch and Portuguese were already there and resented the competition of the British, but the ships were too powerful to be turned out, and sailings direct from China to the London River, instead of buying Chinese goods in India as the company had done in its earliest days, soon brought down the price in Britain and permitted the importation of heavier cargoes such as porcelain.

In those days the masters and officers of East Indiamen, in addition to their regular pay, were given the privilege of carrying so many cubic feet of cargo, according to their rank, free of freight. Tea was debarred and therefore most desired. On the China trade this was a very valuable concession, particularly for the masters who paid very large sums for their commands and still managed to make big fortunes in a few voyages. The officer who had enough money to buy silk in China could make big profits, but, like every other small trader through the ages, he bitterly resented having to pay Customs duties, and the East Indiamen got the reputation of being the worst smugglers under the flag. The Customs told off cutters to meet each homecoming Indiaman in the Channel, generally in the Downs but sometimes off the Isle of Wight, and escort her into the London River. That was circumvented by transferring the contraband into fishing boats in the Western Channel, generally off Poole, and passengers were given a regular price list for the fishermen's services. Naturally they had to trust to their good faith, but in spite of transport difficulties the fishermen always seem to have contrived to deliver the goods in London except when the riding officers and dragoons attacked a party, when they seldom secured the contraband without a stiff fight.



One of the clippers which failed; the "Blackadder" was designed as an improvement on the famous "Cutty Sark" but gave nothing but trouble.

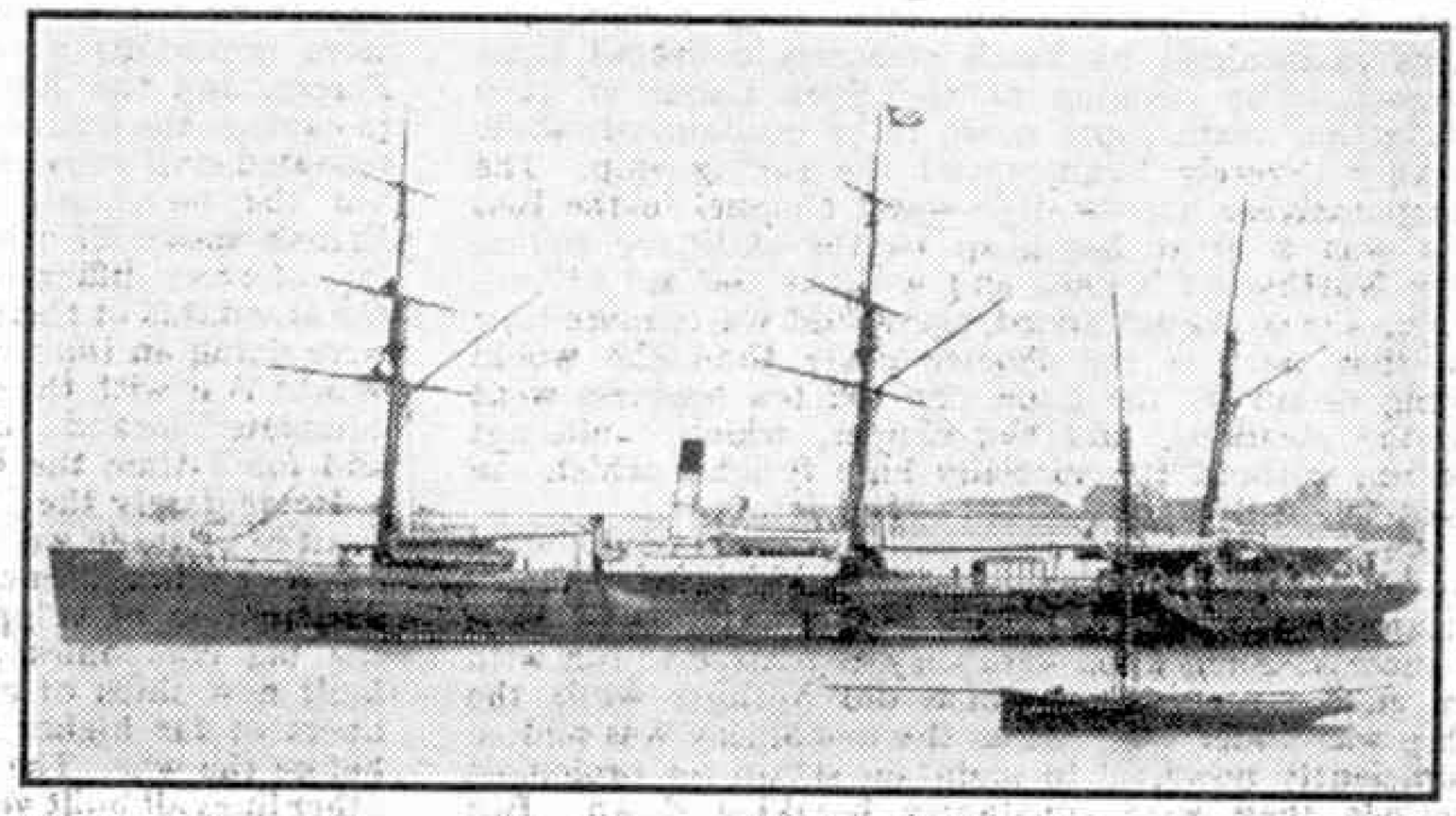
By the latter part of the eighteenth century, when the East India Company in India was becoming more and more a government administration and less a

The fine lines of the famous tea clipper "Titania" in dry dock show how impossible it was to run clipper ships without special clipper freights.

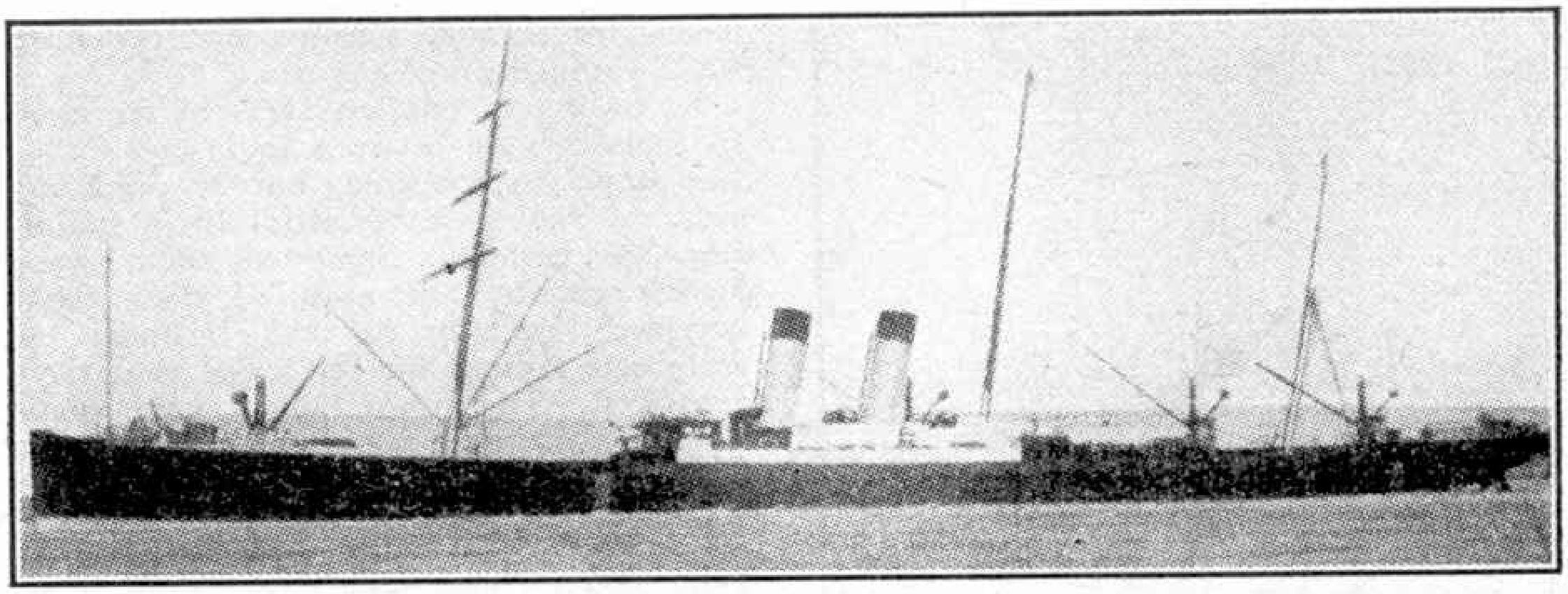
trading company, the Chinese trade was the only one in which it made any profit. Needless to say, its monopoly was constantly attacked, in Parliament quite openly and in Eastern waters by any number of "interlopers" who managed to make big profits out of breaking the monopoly in spite of the regulations of the Chinese Government, which limited the trade to Canton and would only deal with the Company, and the East India Company's cruisers. Local mandarins and merchants were their allies, the former being very ready to take bribes, while in Britain their tea, which naturally had to be smuggled, was much preferred as it was fresh, while the East India Company kept two years' supplies in hand to make sure that there should be no interruption. After the United States became independent they naturally got their tea direct instead of through London and the East India Company.

According to modern ideas of morality the opium trade between India and China was quite indefensible, but it produced some of the most beautiful little sailing ships in history. Some of them were former yachts, but most of them were designed specially for the business by architects famous for the speed that they contrived. The cargo bulked very small so that they were given hulls like racing yachts, but as they had to rely on their speed to evade well-armed pirates, or mandarin junks which were often very little better, they were very much over-rigged, and it is not surprising that a number of them came to grief in the typhoon season.

When the East India Company's monopoly of Chinese trade ended in 1832 there was an immediate rush of British ships of every kind to take their share. Some of them had already been engaged on the illegal side of the business; some of them were quite unsuited for any good trade and were sent out on the totally unfounded supposition that the Chinese merchant would not know any better. Within a few years things had sorted themselves out; British commercial houses long established in China adapted themselves to the new conditions and with their reputation and enterprise steadily increased the volume of business. In the United Kingdom many of the shipowners who had been "ship's husbands" for the East India Company, building ships to their specification and chartering them for a number of voyages, developed the type into what was known as the Blackwall frigate. She was capable of making good



The Blue Funnel steamer "Agamemnon" of 1865, built in anticipation of the opening of the Suez Canal by a company which is still very prominent in trade to China.



"Stirling Castle" was the fastest ship afloat in the eighties, but very nearly drove her owners out of business.

voyages if she had enough wind, and being the best-built type of her day she delivered fine cargoes in good condition. But the Blackwaller was not by any means fast as a rule, and when the American clipper ships which had taken gold seekers to California in '49 and then gone across to China in search of a return cargo were allowed to carry tea to Britain by the repeal of the Navigation Acts, all the merchants wanted their services and for some time they got the cream of the business.

The first result of this invasion of a trade which had been reserved for so long was that British shipbuilders were put on their mettle and soon produced a clipper ship which, smaller than the average American, was remarkably fast. Then the merchants discovered that the big American clippers, wonderful performers as they were, were not ideal. They were generally too big for the trade, with the result that the lower tiers of cases were apt to be crushed by the weight of those above them, and as they were built of soft wood their hard driving soon caused them to leak badly. The result was bad delivery and a preference for the British ships by merchants and underwriters.

Although they carried general cargo outward and were noteworthy for their speed when the wind suited them, the China clippers had no passenger accommodation and for the mails the regularity of the steamer was demanded. The P. and O. Company, which started to run steamers from Suez to Calcutta in 1840, opened a branch service to China in 1845. It was better suited for the silk trade than the sailing ships, the cargo paying such high freight that it was possible to take it from Suez to Alexandria overland by caravan; and as the Chinese Government opened more ports to Western commerce their feeding services maintained by small steamers collected large cargoes. The opening of the Suez Canal in 1869 made the steam route much more economical, while it very severely handicapped the sailing ship. The comparatively narrow deep-water channel in the Red Sea was a great handicap to the ordinary sailing ship Northward bound, and without the aid of tugs which she could not afford, she would waste more time on that part of the shorter route than she would going round by the Cape. So the tea business went to the steamers, and the clipper, which could not be run without the specially high freights which she used to earn, dropped out of the picture.

An attempt was made to get the benefit of the wind by building a few big sailing vessels with auxiliary steam, just enough to get over a calm, but it was not a success. Such ships were very expensive to run with an engine room crew which did nothing while the ship was under sail, and as the machinery was seldom sufficiently powerful to maintain steam for prolonged periods they were constantly breaking down. But the technique of naval architecture and marine engineering was advancing very rapidly in those days, and the yards were soon supplying ships which suited the trade excellently. The steamers of the Glen, Blue Funnel, Skinner and other companies were really remarkable vessels for speed and carrying, the P. and O. were more interested in the passenger side in the early days while the rougher cargoes still went by sail although the ships were no longer clippers by any means.

From the eighties onward some of the romance of the trade disappeared but it was put on to a more practical basis; foreign competition was much more keen but the British owners were able to maintain their position in spite of it. Some ships were built to very special design—the famous "*Stirling Castle*" broke every record and nearly ruined her owners—but the general tendency was towards more efficient design on orthodox lines. The opening of the West-about route from Vancouver by the Canadian Pacific in conjunction with the railway, and the possession of all the Pacific records, diverted a great deal of the silk trade to that route until well into the First World War. Shallow draught steamers of great power and ingenious design were put on to the great Chinese rivers and acted as very useful feeders for the ocean-going ships; both they and the coasting ships under European flags were very popular with Chinese merchants as being much less liable to the attentions of pirates than Chinese small craft.

Competition became more and more keen, particularly after the Japanese Merchant Service was heavily subsidised, but still the British contrived to keep their position although it was increasingly difficult. The companies under the Red Ensign took the struggle into the enemy's camps and included Continental calls in their ships' routes. The First World War was a serious setback, for British ships had to be withdrawn to go on to routes which were more important nationally or to serve the Fighting Forces, and the Japanese did everything they could to capture the business. Later China was distracted by repeated civil wars and then by the Japanese invasion, but the merchants still wanted to trade with the British above all others and succeeded in doing so in face of every difficulty. In return the British improved the standards of their material still further and in 1939 were doing an immense trade. Then came the Second World War with the occupation of Hong Kong and the complete blockade of Chinese ports by the Japanese and for a time the business was in complete eclipse.

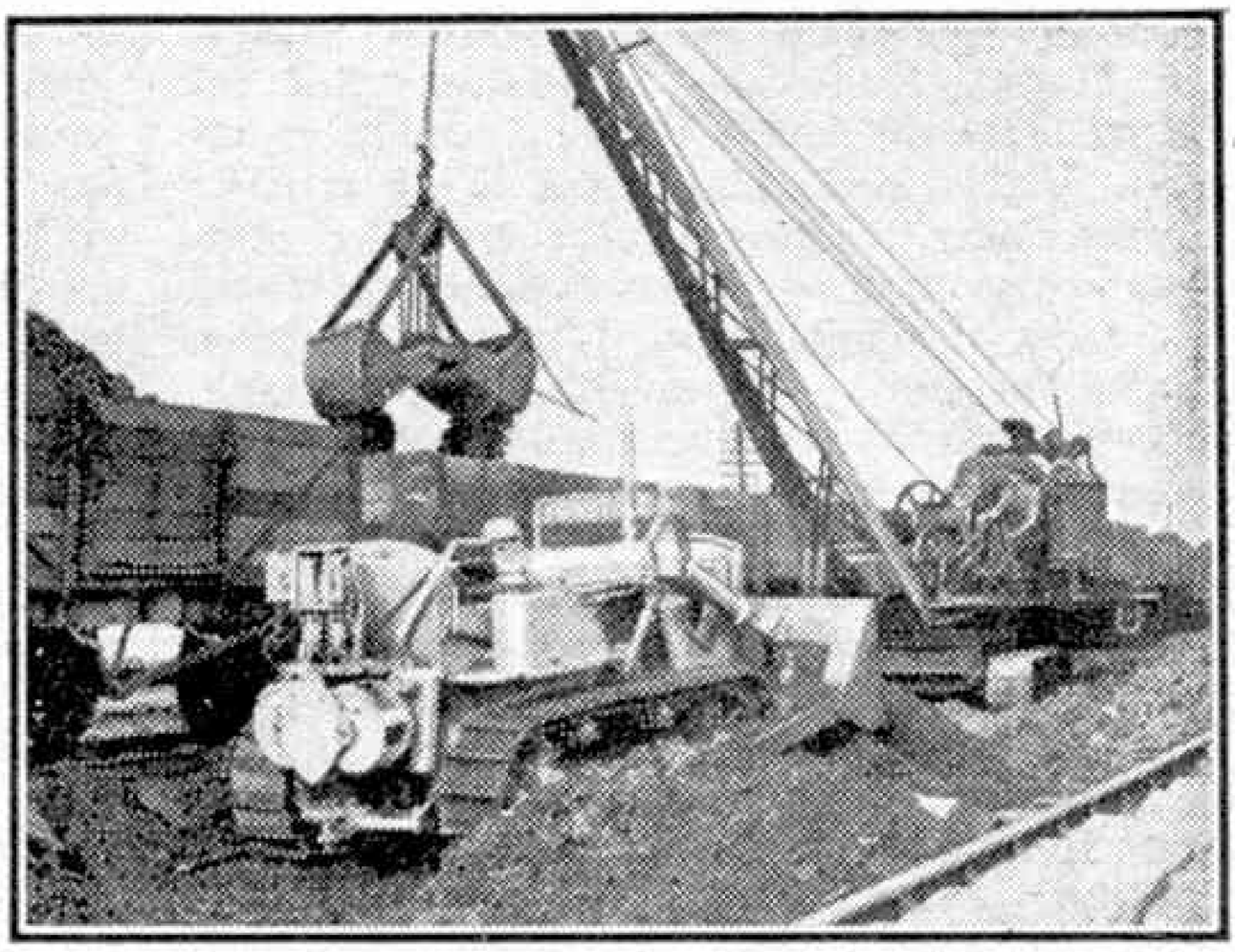
Immediately the Japanese were defeated the opportunities of trade with China seemed to be limited only by the trading licences granted by the authorities. In anticipation of shipping being freed from control all the big companies interested in Far Eastern trade built new ships of outstanding quality, mostly cargo liners of far higher speed than had been considered before the war. The P. and O., Blue Funnel, Ben and other lines all built very fast ships of that type, carrying a few passengers only as the country was still disturbed and the cargo business was the more important. Only the P. and O. ordered the passenger liner "*Chusan*," 24,000 tons with a speed of (*Continued on page 286*)

Renewal of Wiske Moor Water Troughs

TWO miles north of Northallerton on the East Coast Route of British Railways (N.E. Region) lie Wiske Moor water troughs. These have recently been the subject of complete renewal operations, including not only the troughs themselves, but also the track, the ballast and the drainage system.

Formerly the troughs in use took some 15 minutes to re-fill after an engine had passed over and scooped up a supply of water to refill its tender tank. Thus when trains were following each other at short intervals, delay could be caused through insufficient water being available at the troughs, and therefore stops would have to be made at York or Darlington for watering purposes.

The new troughs, which are seen in use in the lower illustration, refill to their capacity of 6,600 gallons in three minutes, being fed simultaneously by four supply pipes equally spaced over the total length. Incidentally an engine passing over the troughs at the minimum speed at which water can be taken up—20 m.p.h.—would pick up 3,500 gallons by means of its tender scoop, or "dip" as enginemen call it.



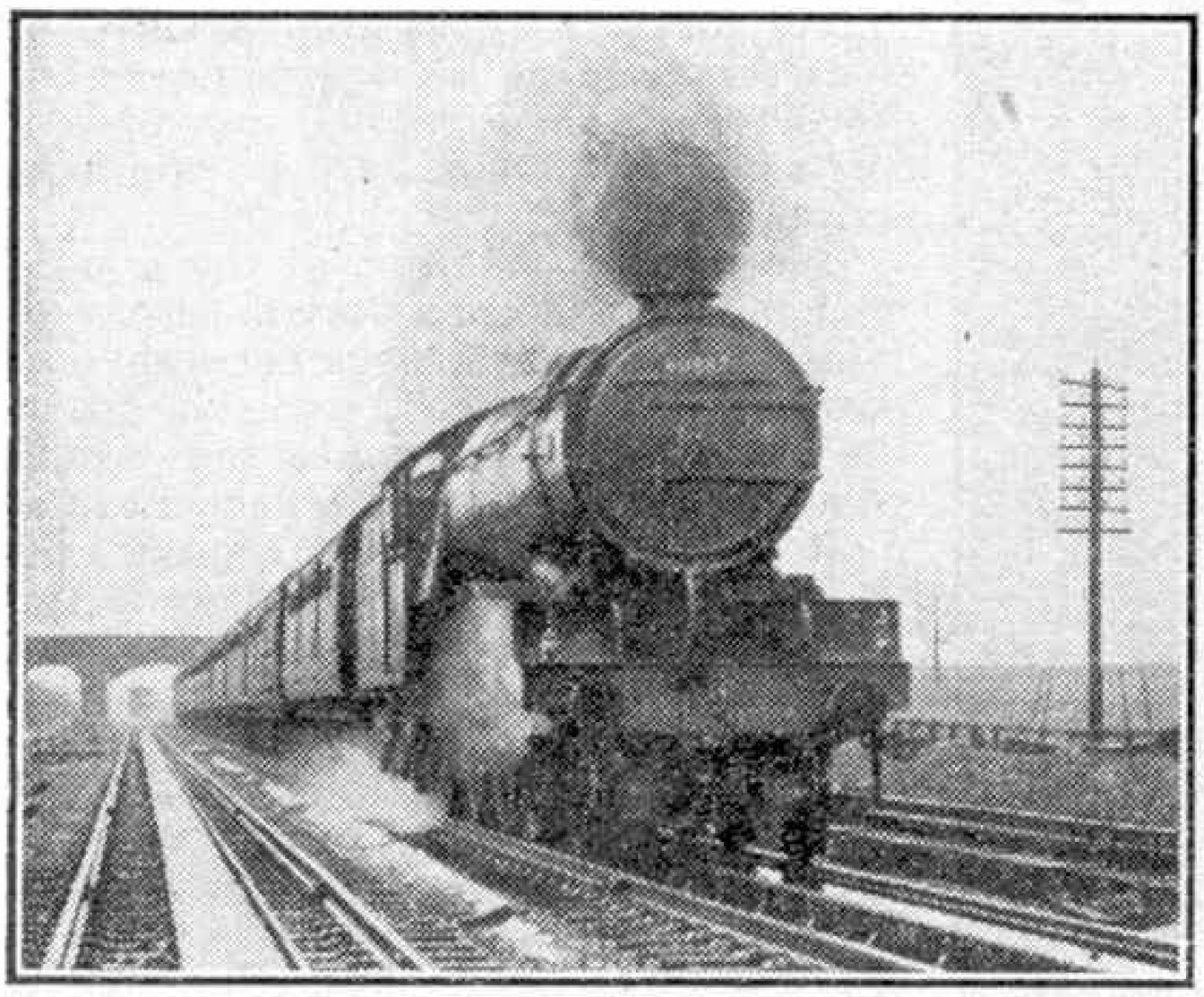
Excavating the old ballast at Wiske Moor before the installation of new steel water troughs. These photographs and details are by courtesy of British Railways (N.E. Region).

After the old troughs and their permanent way had been dismantled, 3,500 cu. yds. of stone ballast that had become waterlogged by constant flooding from the use of the troughs were excavated to a depth of 18 in. Modern plant, including an excavator with a skimmer attachment and a caterpillar tractor with bulldozer equipment, was used to remove the old ballast.

New ballast was laid down and the new steel troughs in sections 20 ft. long were welded together to produce 60 ft. units, and mounted on assembled standard 60 ft. sections of flat-bottom track. When these had been laid in position by crane the trough joints were welded together, resulting in a continuous steel channel 620 yds. long.

During the renewal operations the entire drainage system was re-aligned, existing timber manholes were replaced in brick, and in all 65 manholes were constructed.

The main water supply for the troughs is obtained from the river Wiske, one mile from the railway. Diesel-driven pumps deliver it to two separate tanks, each of 27,000 gallons capacity, placed 200 yards apart alongside the troughs.



The new troughs in use at Wiske Moor. The engine of a down express picks up water.

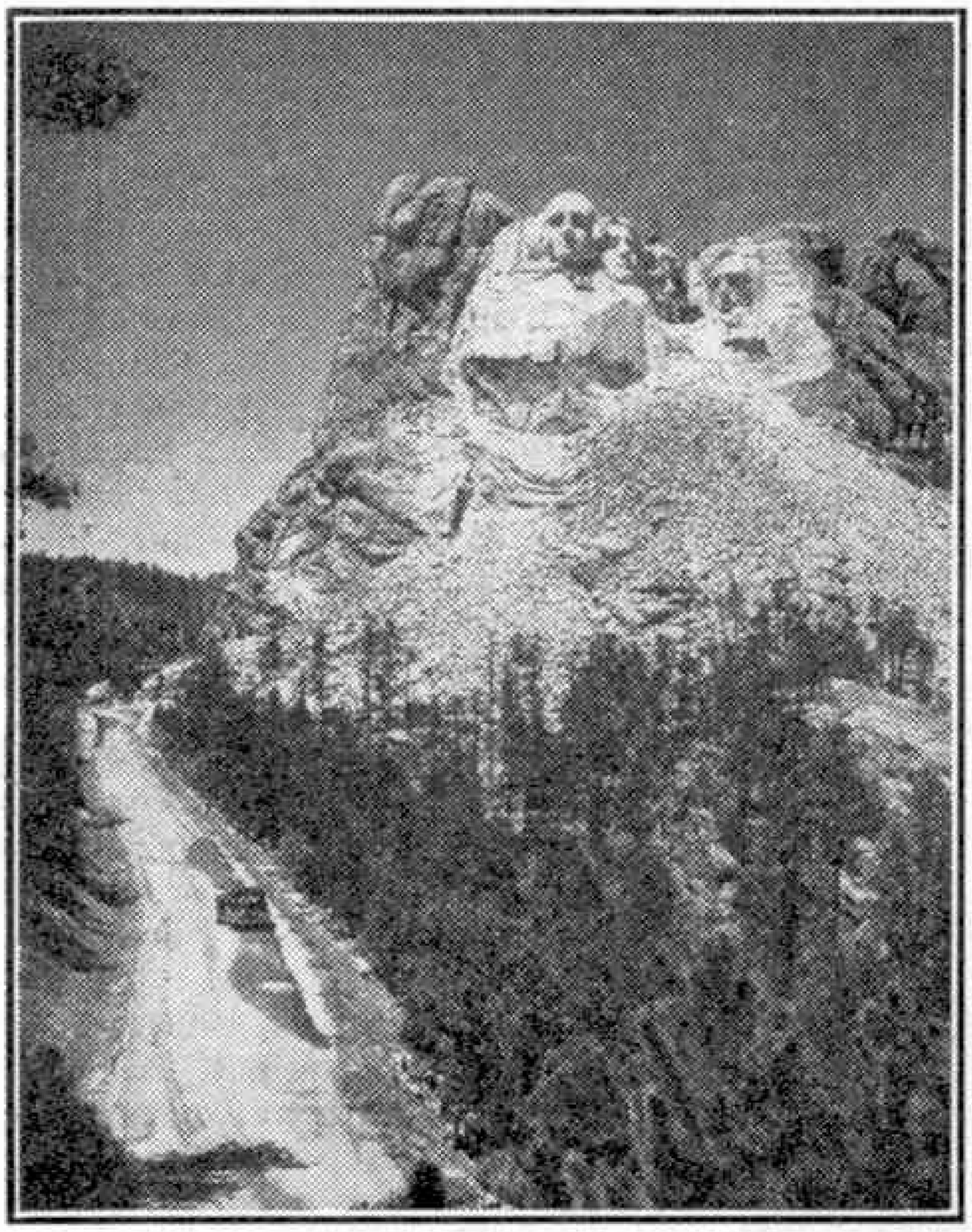
The World's Greatest Sculptures

60 ft. Faces Carved on a Mountain in Western America

By Harold J. Shepstone, F.R.G.S.

THE recent completion of monster heads reproducing the features of four famous presidents of the United States on Mount Rushmore, a granite cliff in South Dakota 3,000 ft. long and 800 ft. high, marks the climax of a great artistic undertaking. These sculptures, far and away the largest ever fashioned, show the faces of Washington, Jefferson, Lincoln and Theodore Roosevelt. They have taken some 20 years to carve and are the creation of the famous American sculptor Gutzon Borglum.

Hitherto the Sphinx in Egypt, the winged bulls of the Assyrians and the heroic figure of Darius at Persepolis, in Persia, have been regarded as the greatest of sculptures. But the head and face of the Sphinx is a pigmy compared to the lifelike portraits on Mount Rushmore. For instance, the artistic face of Washington is 60 ft. high and his eye is so big that a man can sit in it.

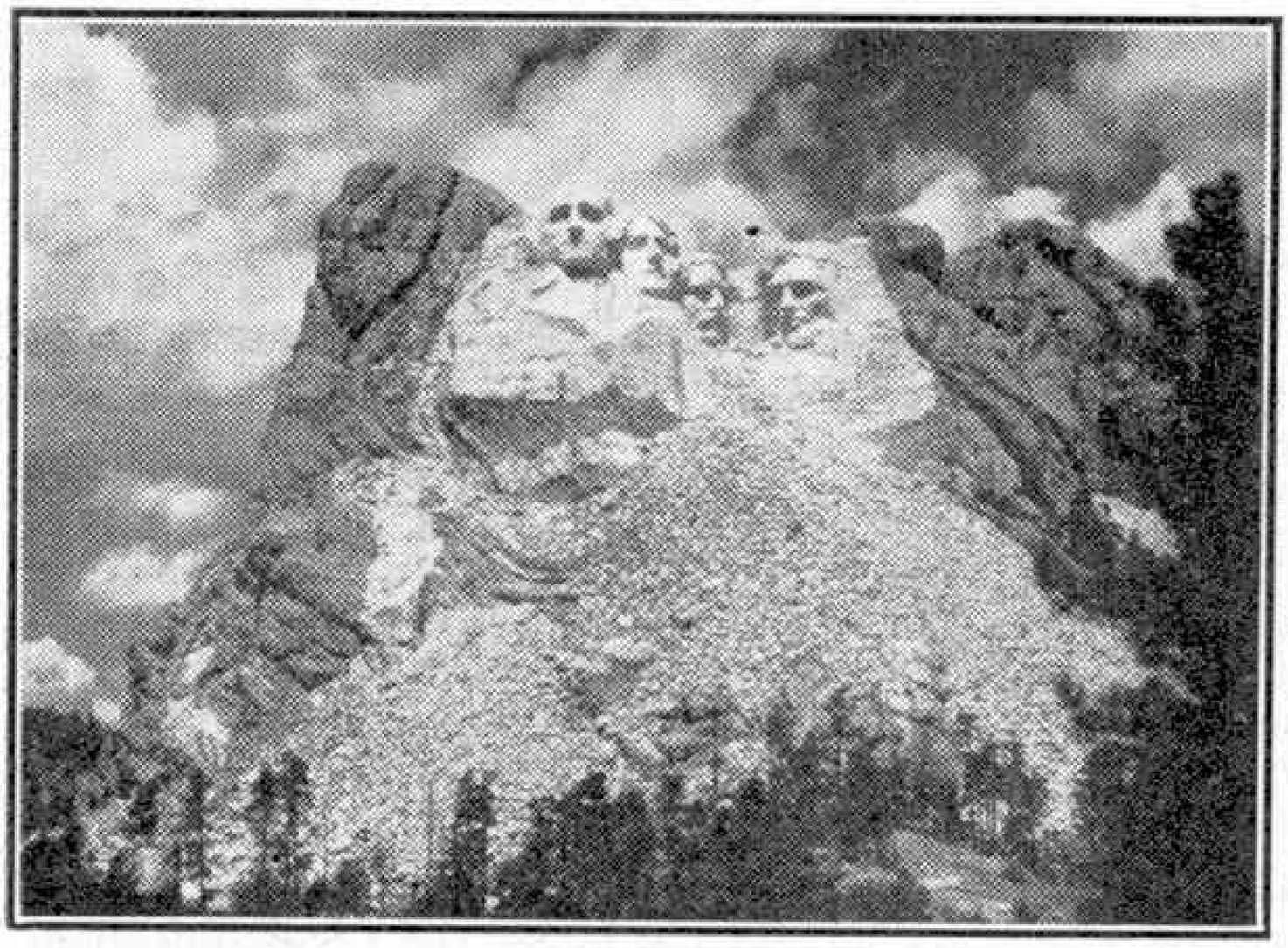


The colossal sculptures of the heads of four Presidents of the United States, carved on Mount Rushmore. From chin to forehead each measures 60 ft.

These faces have been carved on one of the peaks of the Black Hills in Western America, not so much to create a record in size as to proclaim an idea. They form an imperishable memorial to the leaders of a great nation, a Shrine of Democracy as it has been called. Washington was selected because he was the rock on which the great republic of the West was founded. Thomas Jefferson was the chief author of the Declaration of Independence, and by the purchase of the Louisiana Territory he started the nation's growth westward. Abraham Lincoln, the saviour of the republic and the president under whom Alaska was acquired, was inevitable in any record of the country's history; and finally Theodore Roosevelt was selected because by cutting the Panama Canal he accomplished the dream of Columbus and opened a sea-way from Europe to Asia.

Borglum started work on the mountain in 1925. At first this was slow and there was considerable opposition. The necessary funds came from the three railways serving the State and from private individuals. Two years later President Coolidge visited the Black Hills and suggested to the sculptor that he should come to Washington and appeal for help. This step resulted in Congress granting an appropriation of £50,000 for the Memorial, provided a like sum was obtained by private subscription.

The cracked condition of the granite rendered the sculptor's work most trying. It meant a constant struggle between composition and finding solid stone for each of the four heads. For instance, the original plan was to place that of Jefferson to the right of Washington's, and Lincoln's on the left. There were serious flaws in the stone on this side of Washington, however, and it became necessary to change the plan and place Jefferson to Washington's left. This meant that the head of Theodore Roosevelt had to be placed between those of Jefferson and Lincoln, and the stone had to be removed to a depth of approximately 120 ft. from the original surface to get back far enough for the Roosevelt face.



The four Presidents whose heads have been carved on the summit of Mount Rushmore are Washington, Jefferson, Theodore Roosevelt and Lincoln respectively.

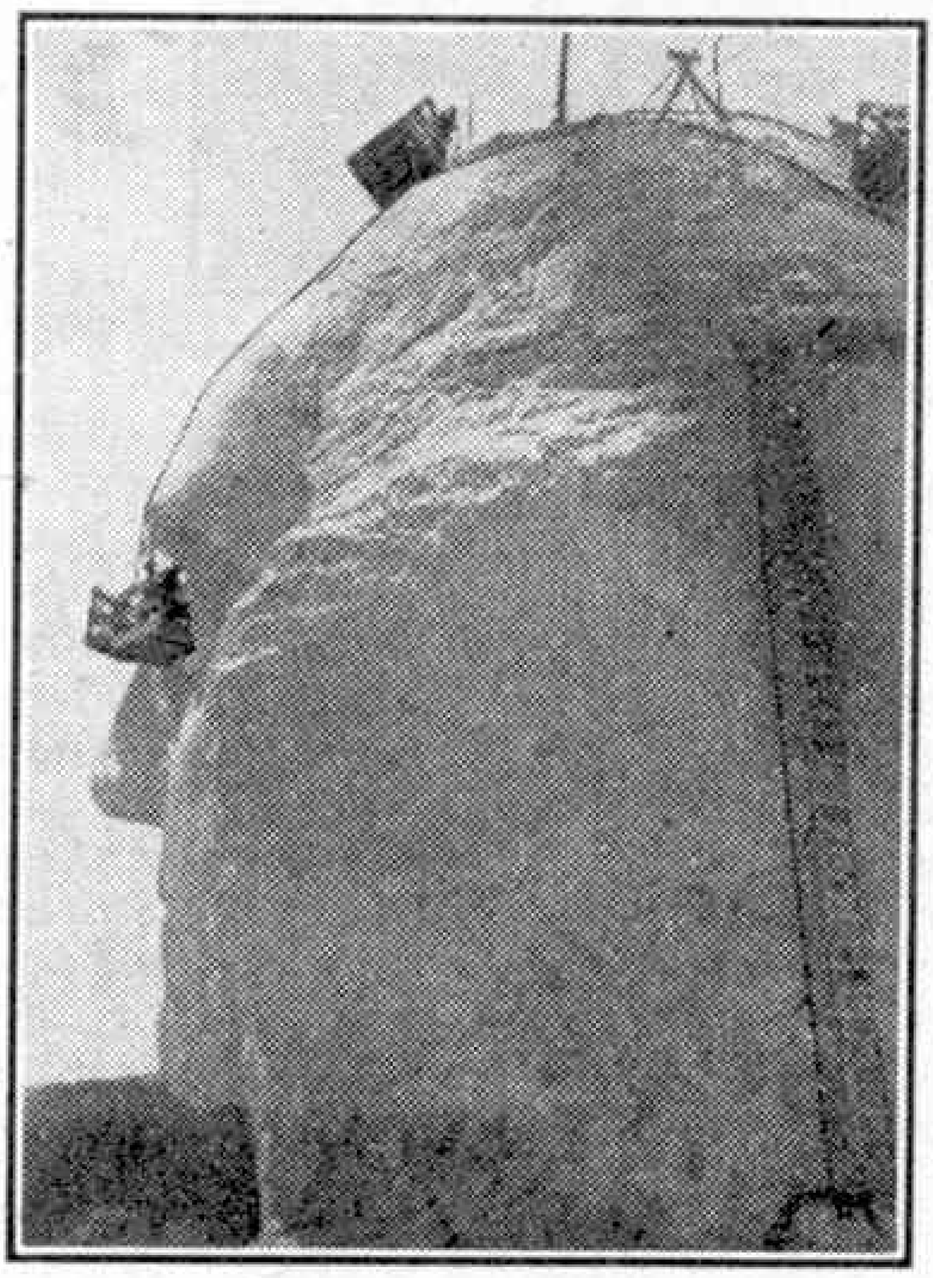
To give access to the site of the memorial a temporary road was constructed from a mining camp three miles away. The cliff on which the heads are carved rises abruptly from a canyon. The lower slopes are wooded with pine trees, and above them the rock extends almost perpendicularly upward. Over 400,000 tons of granite were removed in carving the figures. The work was done with compressed air tools, and the men who did it were let down over the face of the stone in leather swings similar to the bos'n's chairs used on ships. These swings were attached to steel cables operated by hand from winches on top of the heads. On each head there were seven of these winches.

One man was located in a position where he could see all the others at work. He was the "call boy" and had a microphone connected with a loud speaker at each of the winches. When any of the men working on the swings wanted to be raised or lowered they signalled the call-boy and he relayed the message through the loudspeakers to the winchmen. He also kept the workmen supplied with new drills as they needed them by relaying their requests to the steelman.

The figures were roughed out by means of "jackhamer" drills. The maximum depth of the holes was 40 in., and blasting was done with dynamite cartridges fired electrically. After roughing out greater care in drilling was necessary, and no more blasting was done, the final 6 in. of material being removed by the use of tools only.

The problem of finance was always acute. It became increasingly difficult to match the Government's appropriation, without which the carving could not go on, and there were long months when the work was stopped altogether. In 1938 Mount Rushmore was made a National Memorial, however, the Government then taking over the whole burden of financing the undertaking.

The Washington head was unveiled in 1930, and that of Thomas Jefferson six years later. Naturally no carving could be done in bad weather and in the depth of winter work would be held up for days together. On windy days it was often nerve-trying toiling high up on the face of an open cliff. It was Borglum's boast that no worker was seriously injured. But the strain of working at such an altitude weakened his heart and he died in 1941. Fortunately, the carving was practically finished, and the completion of the work was entrusted to the sculptor's son, Lincoln Borglum. The cost of the Memorial, including carving, buildings and salaries, was about £200,000.



This side view of the Washington head shows how deeply the rock had to be cut away to prepare for the next figure, and how the work was carried out.

Behind the Weather Forecasts

By W. H. Owens

NOWADAYS weather forecasting ranks with the most important of our public services. Everybody is interested, for a variety of reasons, to know what to-morrow's weather may be like. For many people, farmers or deep-sea fishermen for example, the detailed forecasts broadcast regularly during the 24 hours may be vital to the success or even the safety of their daily jobs.

At Britain's meteorological headquarters at Dunstable, in Bedfordshire, scientists and engineers have combined to make weather forecasting much more accurate than it might sometimes seem from the wireless or newspaper reports. In spite of the rapidly changing conditions over land and sea, the official predictions made over 24-hour periods are about 90 per cent. accurate, and short term and localised forecasts can be very accurate indeed. It is the valuable long term and distant ones which require the very complex organisation that is behind the Meteorological Service to-day.

Ready to release a pilot balloon. When it is in the air sights are taken on it to find the speed and direction of the wind at various heights.

Although every country has its own forecasting agency, this is obviously a service that can only function through international co-operation. The Central Forecasting Station gathers a mass of information every day from many different quarters. This is received from the special fleet of weather ships in the North Atlantic, and from many other ships on the high seas that voluntarily undertake meteorological observations, from the direct air reports of "Met" Flight, and from hundreds of weather reporting stations scattered widely around the British Isles and the Continent, in Iceland and the Azores, and in places even farther away. All the messages are transmitted in the same international code, which overcomes the difficulty of language and ensures speed and accuracy at both ends.

Day and night, information flows in a continuous stream through the Communications Room at Dunstable by radio and teleprinter. The reports of rainfall, sunshine hours, gales, fog, humidity, cloud conditions and so on are carefully sifted and then plotted, several times a day, on large weather charts. These charts embrace an area from just east of Newfoundland to Russia, and from the Arctic Circle to the Azores, the Mediterranean and North Africa. Lines known as isobars are drawn across them to show up the regions of high and low pressure, which are more familiar to us as the anticyclones and depressions, and important "fronts" or boundaries between different air masses.

Thus the experts have always a complete and hour-to-hour picture of the weather all over Europe and the Atlantic. The knowledge gained from a study of the behaviour and movements of the pressure systems and fronts forms the basis of their forecasts for periods of 12 or 24 hours.

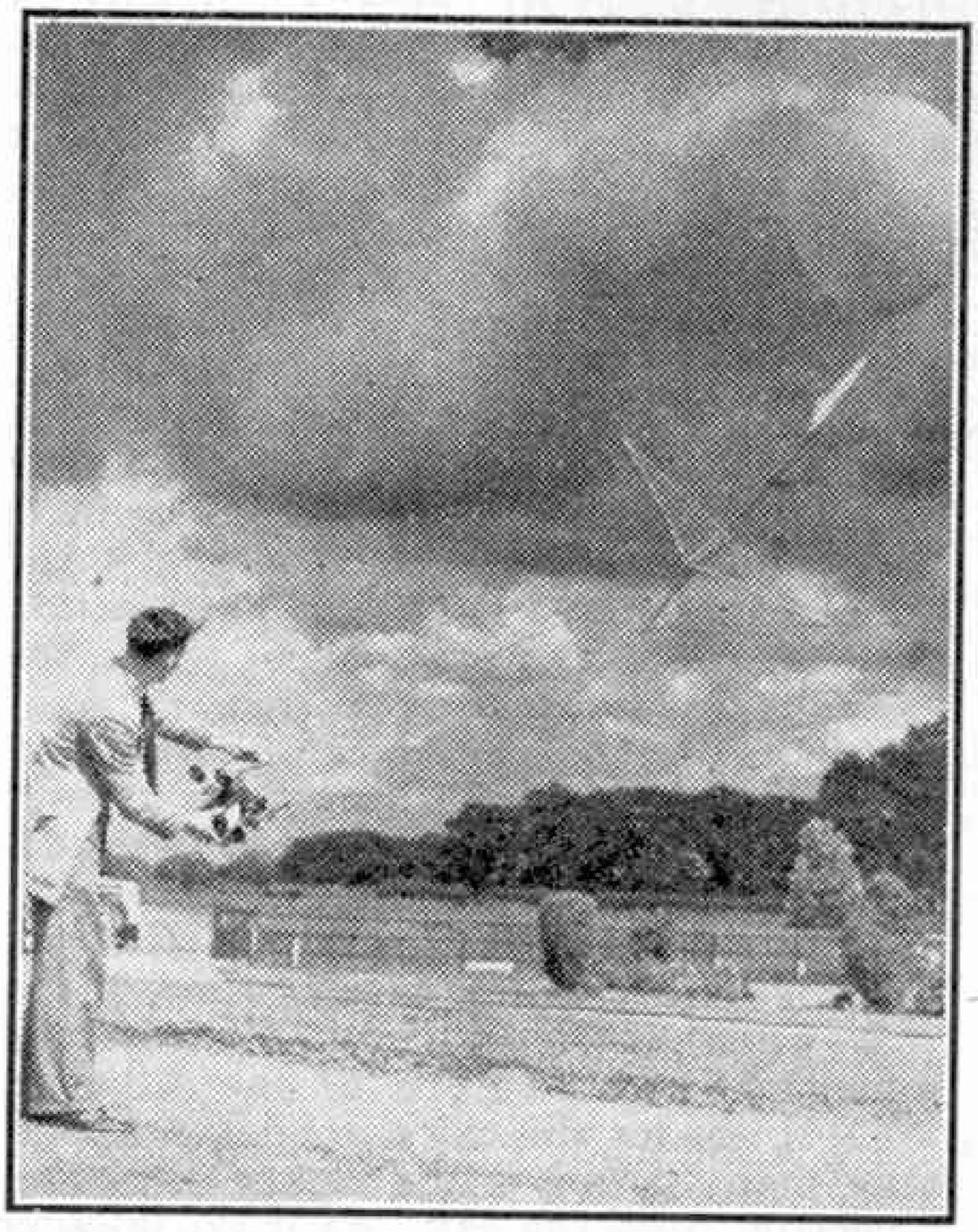
The North Atlantic weather ships, at ocean stations from Iceland to the Azores, play a leading part in our weather reporting system. This fleet of 13 ships was established by international agreement in 1947, and is maintained and operated by eight maritime nations, Great Britain, Canada, the United States, France, Belgium, Holland, Norway and Sweden.

The primary purpose of the Weather Fleet is to provide floating "islands" out in the Atlantic from which daily

meteorological observations of surface and upper air conditions can be made. The ships carry complete scientific equipment, including radar and the special apparatus for preparing and launching radio-sonde balloons. They are also equipped with Air-Sea rescue gear for assisting aircraft or shipping in distress on the Transatlantic routes, and in addition they provide navigational aids to aircraft in flight.

Great Britain operates two of the Atlantic stations with the four weather ships *"Weather Observer," "Weather Recorder," "Weather Watcher,"* and *"Weather Explorer."* Two ships are in operation at a time and two are kept in reserve. All the ships are ex-Naval "Flower" class corvettes which were in service during the war, and each carries a crew of about 50 men. The stalwart crews, who have to endure the worst of the Atlantic storms and gales, are among the first to know what to-morrow's weather will be like over the British Isles and Western Europe generally.

The radio-sonde balloon, which was on the wartime secret list, is a meteorological device that enables the weather men to measure temperatures and humidity at very great heights, up to 50,000 or 60,000 ft. Some balloons are known to have reached even higher altitudes. The hydrogen-



Wind currents at different levels are plotted by attaching a large tinfoil kite to a radio-sonde balloon, the course of which is followed by radar long after it has disappeared from sight.

Examining instruments after a "Met" flight.

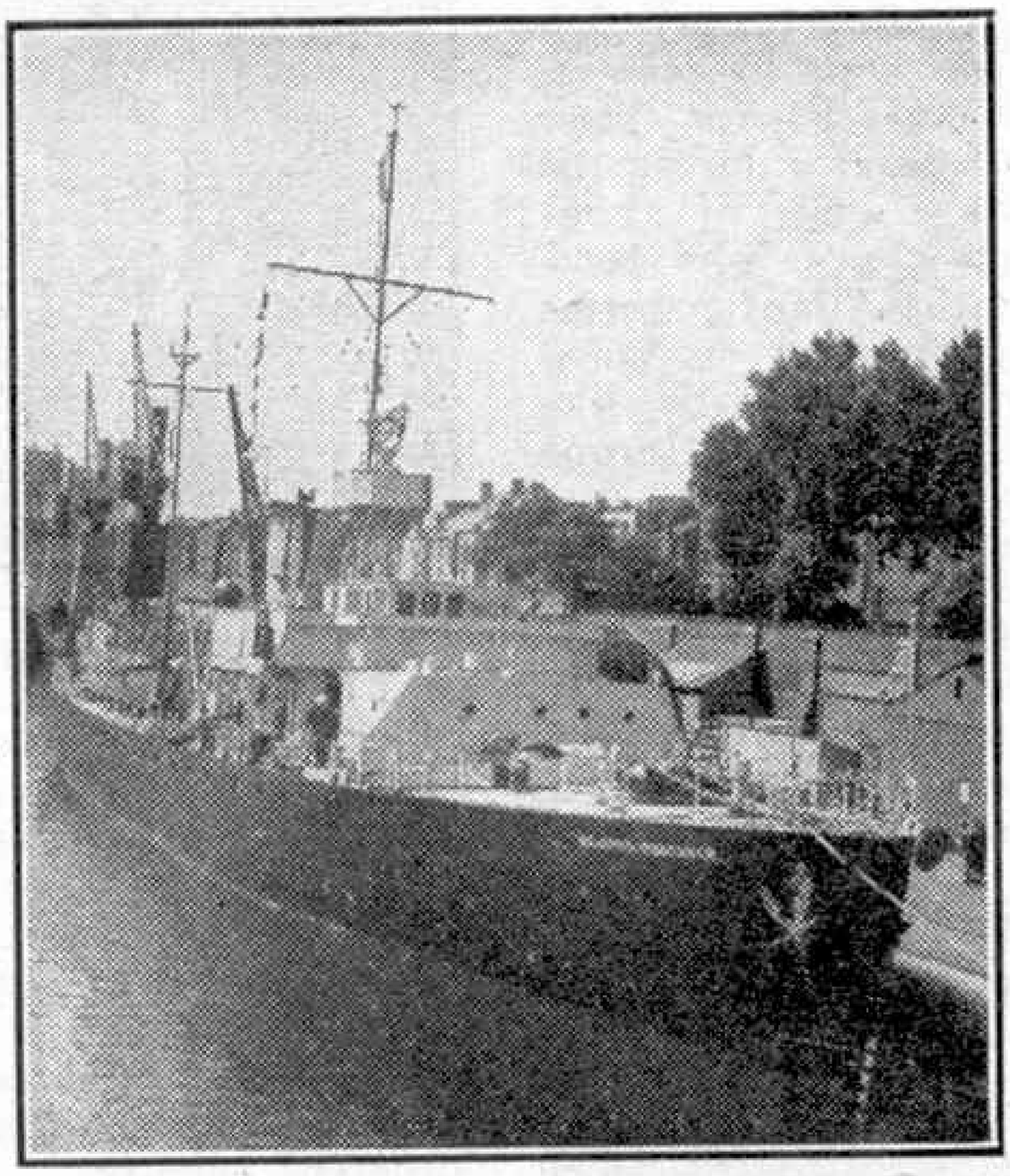
filled balloons have delicate measuring instruments attached to them, including a small radio transmitter which weighs from three to four pounds. During its flight the transmitter broadcasts three musical notes in sequence, the variations of which indicate to listeners on the ship or at the ground station the degree of pressure, temperature and humidity at different heights.

As soon as the balloons reach the stratosphere they burst, and the transmitters float down by parachute. Many of them are naturally lost over the sea, but on land they are frequently recovered and after reconditioning are used again. Wind currents at different levels are plotted by attaching a large tinfoil kite to the balloon. Radar impulses sent out from ship or station are reflected by the kite, so enabling its course, speed and direction to be plotted with considerable accuracy long after it has disappeared out of sight.

Radio-sonde ascents on land are made four times each day from eight Air Ministry stations, extending from the Shetland Isles down to Cornwall. The balloons are sent up at regular times in any sort of weather by day and by night. Because of the steady reduction of pressure as they ascend, they expand to something like four times their normal inflated size by the time they burst in the stratosphere

Apart from the radio-sonde apparatus, small pilot balloons are released regularly at all air stations for measuring the speed and direction of winds. When these are launched in the air, their path is closely followed with the theodolite and so accurate measurements can be taken on them at various heights.

Just as regular as the radio-sonde ascents are the day by day flights of the special air reconnaissance squadrons known as "Met" Flights. No storm can keep these aircraft or their pilots aground. Their job is to gain information about the weather conditions in the upper air and in regions that could not be explored by the radio-sonde. The development of "Met" flying during the war was one of the less spectacular tasks of R.A.F. Coastal Command, but one which contributed in no small measure to the total defeat of the enemy.



"Weather Observer," one of Great Britain's four weather ships, with which two Atlantic weather stations are operated. These vessels are ex-Naval "Flower" class corvettes.

The "Met" aircraft fly out from bases in Britain over the Atlantic for a distance of about 600 miles. Then they climb to an altitude of about four miles, alter course, and continue to fly at the same level for 250 miles before descending again to normal flying height and returning to base. In times of rough weather over the Atlantic these flights, as can be well imagined, become very hazardous indeed, and so demand absolutely first-class skill on the part of the pilots concerned.

During the flight weather observations are recorded at pre-arranged levels and distances by a special member of the air crew known as "Met" Air Observer. The aircraft is usually in the air for 10 or 11 hours, and for this long journey it is heavily loaded with petrol carried in long-range fuel tanks. Pilots have a set course and a timetable that must be followed rigidly, whatever the weather conditions. Storms which other aircraft would avoid must be flown through, while pilots often have to contend with severe icing or blinding snow.

Another scientific aid to our weather forecasters is what is called the "thunderstorm locator." This, like radio-sonde, is an ingenious wartime invention designed to assist Allied flying operations over the Continent and elsewhere, and many thousands of airmen probably owe their lives to it. To-day, it still serves air crews and the weather men alike.

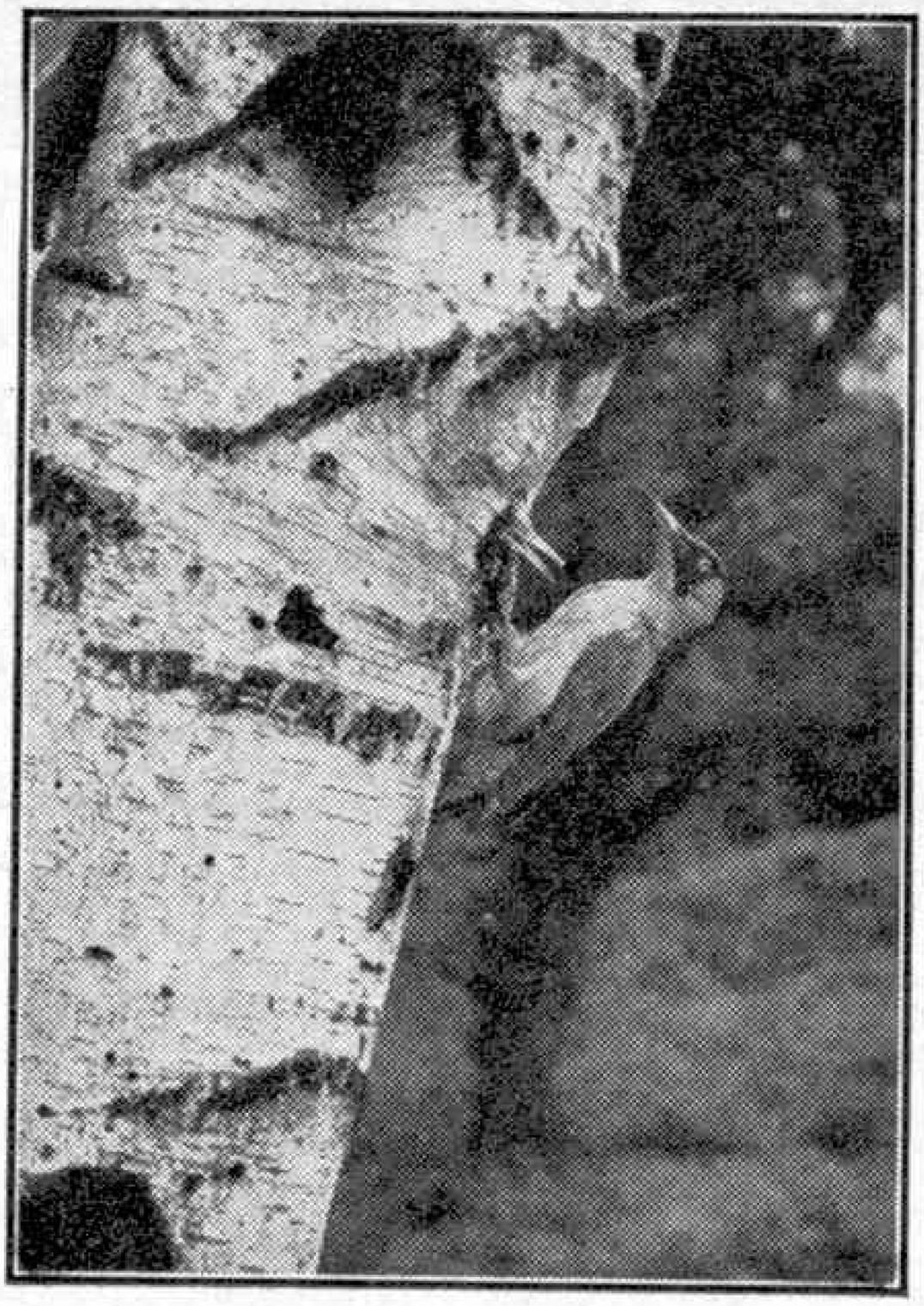
Those all too familiar "crackles," coming from lightning flashes, which interfere with our radio listening at home, are put to good use in weather forecasting when they are received on special radio direction finders equipped with television tubes. Four thunderstorm locators, set up at Dunstable and in Scotland, Cornwall and Ireland, record simultaneously all the main lightning flashes within a radius of 1,000 to 1,500 miles from London. The exact bearing of each flash is immediately given by a scale marked on the television tube, and, as all the four stations are linked by private telephone lines, the control station at Dunstable can at once plot the bearing lines on a map, the intersection of the four lines giving the spot where the lightning flash has just occurred.

By this means the spread of thunderstorms can be followed from hour to hour and new outbreaks may at once be detected. Thunderstorms occur much more frequently than we might suppose. Indeed, there is hardly a day at any time of the year when lightning cannot be recorded somewhere over Europe or the Atlantic. Were it not for this very wonderful apparatus, many storms would escape detection, especially over the sea, As it is, thunder associated with bad weather approaching from a distance may be forecast days ahead of its arrival. (*Continued on page 286*)

Post Office versus Woodpecker

By David Gunston

FROM the point of view of the G.P.O. the most harmful birds in this country are the green and greater spotted woodpeckers, for these are the birds which cause so much damage to the six million or more telegraph poles that dot the countryside. Every spring and summer these woodpeckers turn their attention to telegraph poles, in their natural search for old timber, preferably dead or rotten, in which to make their nesting-holes. Attacks are made with startling regularity on favourite poles, and holes with opening diameters of three or four inches and depths of anything up to eight inches are frequently discovered.



A green woodpecker about to feed a young bird in a nest in a birch tree trunk. Photograph by J. Warham.

Although these at first mysterious holes had long been known by the telephone engineering staffs, it was not until 1932 that woodpeckers were found to be the culprits. Since then the Post Office have waged an unceasing but bloodless war on these otherwise beneficial birds, which, by the way, are protected in most countries from March to July or permanently.

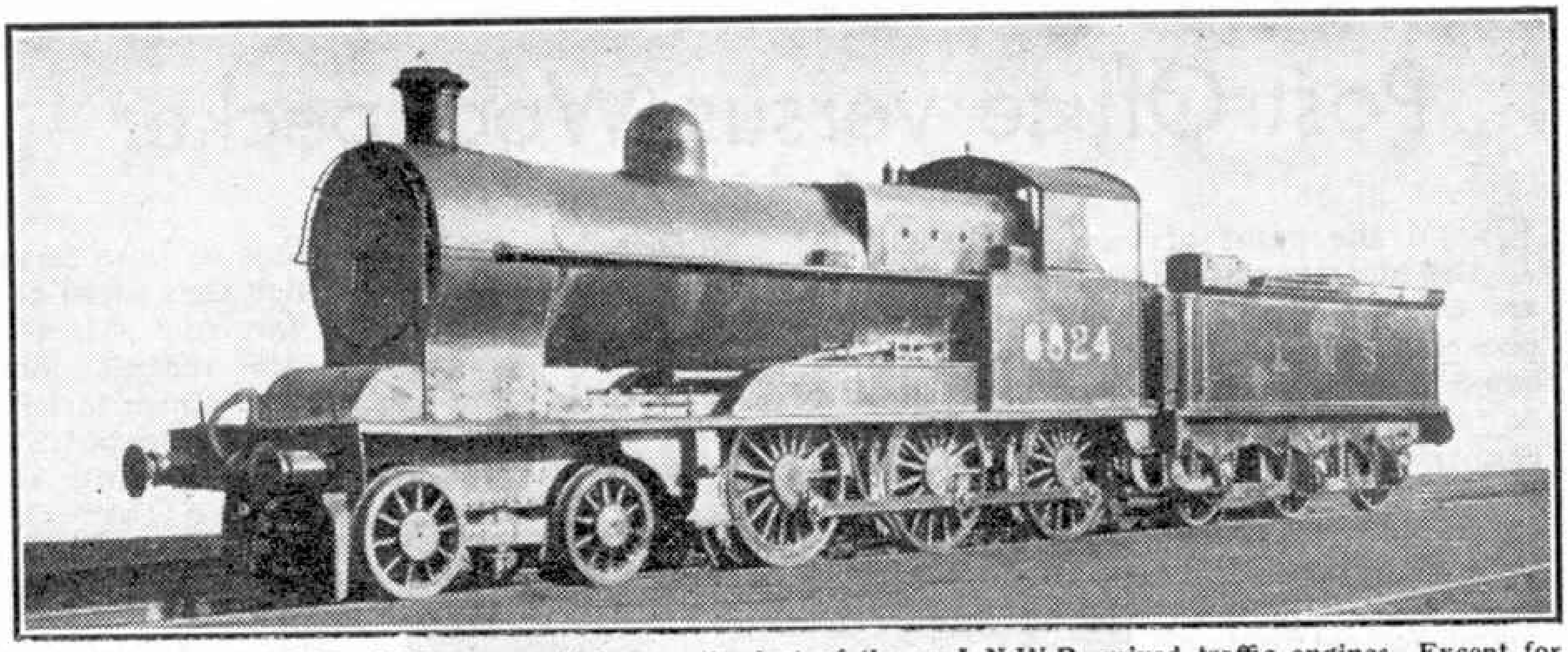
The counter-attack took the form of regular inspection of all poles in country parts and the reporting of all new borings. These were then immediately filled in with various compositions. Many fillings have been experimented with, including bitumastic, iron, tar and concrete compounds, but the one now used is made to a secret formula. The hole is filled in thoroughly and the surface coated with tar. It does not always deter the birds, and on one occasion a green woodpecker renewed its efforts on a concrete-plugged hole on three consecutive occasions. In any case there is nothing to stop the woodpeckers from returning to bore fresh holes in the same pole, which they often do.

The G.P.O. were still far from satisfied with their progress in the matter, and some little time ago further consultations with bird experts resulted in the putting forward of the theory that the birds are attracted by the humming of the wires overhead in a slight breeze.

Green woodpeckers do most of the damage, and their fondness for bees and honey is well known, there being many authenticated records of yaffies, as these birds are called in some areas, robbing and breaking open hives. It seemed possible therefore that the birds were drawn to particular poles in the mistaken belief that they housed wild bees. In any event, certain poles were attacked over and over again in successive seasons, sometimes so badly that they had to be replaced by new ones.

It was then found that there was truth in this idea, and that the birds ignored those poles where the wires were always silent. So, by way of experiment, many miles of wires and poles in Essex, Yorkshire and Nottinghamshire, the areas affected most, were adapted by means of lead strips lapped spirally over the first ten inches of the wires and over the insulators. This silenced the familiar humming sound, and sure enough the desired result appeared to have been achieved, for the woodpeckers kept away.

It might be added that this work was only completed at considerable cost, but then the Post Office have had to spend many thousands of pounds in the anti-woodpecker campaign over the last decade or so. Many poles (Continued on page 286)



Former L.M.S. 4-6-0 No. 8824, now withdrawn, the last of the ex-L.N.W.R. mixed traffic engines. Except for the Belpaire fire-box the engine remained in practically its original condition. B.R. Official Photograph.

Railway Notes

By R. A. H. Weight

The Last "19-inch Goods."

Locomotive No. 8824, illustrated above and recently withdrawn, was the last of the former L.N.W.R. so-called "19-inch Goods" class 4-6-0 locomotives to remain at work. Thus within a year, roughly, the last representatives of four once numerous and well-known classes of L.N.W.R. origin have disappeared. The last members of the other three classes, a "Precursor," a "Prince" and a "Claughton," respectively, were illustrated together in these pages last October.

The first "19-inch" engines were built at Crewe in 1906 to the designs of George Whale. They were in effect mixed traffic versions of his "Experiment" class of express passenger locomotives, and were sometimes called "Experiment goods" on that account. The name "19-inch," by which they were usually known on the line, referred to the diameter of the cylinders. Their 0-6-0 predecessors, the familiar "Cauliflowers," had 18-inch cylinders and were the first Crewe engines to use this diameter; so they were termed "18-inch Goods," and when the Whale 4-6-0s came to replace them, they in their turn become known as "19-inch Goods."

Only six of the total of 170 in the class have been in service during the past 10 years. These have been based on Springs Branch and Patricroft, No. 8824 having been allocated to the former depot.

The "19-inch" Goods engines had two cylinders 19 in. by 26 in., 5 ft. 2½ in. coupled wheels and Joy's valve gear. Boiler pressure was 175 lb. and tractive effort 22,338 lb. The weight of engine in working order was 63 tons, and tender 37 tons.

These locomotives were much more successful than their express passenger cousins and outlived them by some 15 years. In appearance they were similar to the "Experiment" passenger class and they carried the unmistakable "Crewe-built" hall mark. They had the usual strictly utilitarian 3,000 gallon Crewe tender, and until L.M.S. days they had the standard L.N.W.R. boiler with round-topped fire-box. Some were afterwards rebuilt with Belpaire fire-boxes, and No. 8824 was one of them.

They were originally fully lined out and carried the L.N.W.R. crest on the splashers over the centre line of the leading and intermediate coupled wheels.

Eastern and North Eastern Regions

The Railway Executive have announced the allocation of the names we reported in the March "*M.M.*" to individual "A1" 4-6-2 locomotives, but few plates had been completed or affixed at the time of writing. We do not propose to publish a complete list again at this juncture, but we will report various engines from time to time as they appear in service carrying names. Some of the engines of course work also in the Scottish Region. The name "*Guillemot*" is to remain on "A4" No. 60020, being replaced in the new list by "*Kittiwake*." No. 60133 is named "*Pommern*."

New "B1s" are coming into service in two series, including Nos. 61360-1 stationed at Stratford (30A); Nos. 61400-1 is at Kittybrewster (61A). Engines of this type from Immingham Shed have been working through from Grimsby to Kings' Cross and back daily; they also run to Swindon (W.R.), via Banbury, as do "B17" 4-6-0s. Continuing construction of "L1" 2-6-4Ts, Nos. 67779-83 were lately allocated to Neasden, 34E, on arrival from Robert Stephenson and Hawthorns Ltd. To complete the "K1" 2-6-0 batch, Nos. 62069-70 are stationed as new engines at March, 31B.

The locomotive shed numeration described in our January 1950 issue for the Eastern and North Eastern Regions is now in force, so the code letters and figures will be used when reference is made to allocations. This will now apply to all Regions.

Automatic train control gear has been fitted to a number of 4-6-2 and 2-6-2 locos. for trial along sections of the former Great Northern main line. The drivers will be given audible or other indication when certain signals are at danger, by means of the apparatus installed.

Interesting news regarding operation of the "*Flying Scotsman*" express to and from King's Cross with a 13-coach train weighing just over 500 tons includes details of a good run by "V2" No. 60800 "*Green Arrow*." This King's Cross engine was substituted owing to a slight defect on the "A3" intended for the working. In spite of 5 min. lost by permanent way repair slowings, Grantham was reached 1 min. early on the present fastest 2-hr. timing for the 105½ miles from London.

On another occasion the southbound train was seen passing Wood Green at a good speed about 8 min. early; "A1" No. 60139 having about 17 min. in which to cover the last 5 miles.

Grantham "A4" No. 60030 "*Golden Fleece*" recently achieved another excellent record of continuous running with this famous express and other heavy East Coast trains between London and Newcastle. "A2" No. 60533 "*Happy Knight*" was transferred to Copley Hill shed, Leeds, in March last for working fast freight train trials through between the West Riding and Finsbury Park, just outside King's Cross. Such express goods trains average 40-50 m.p.h. over

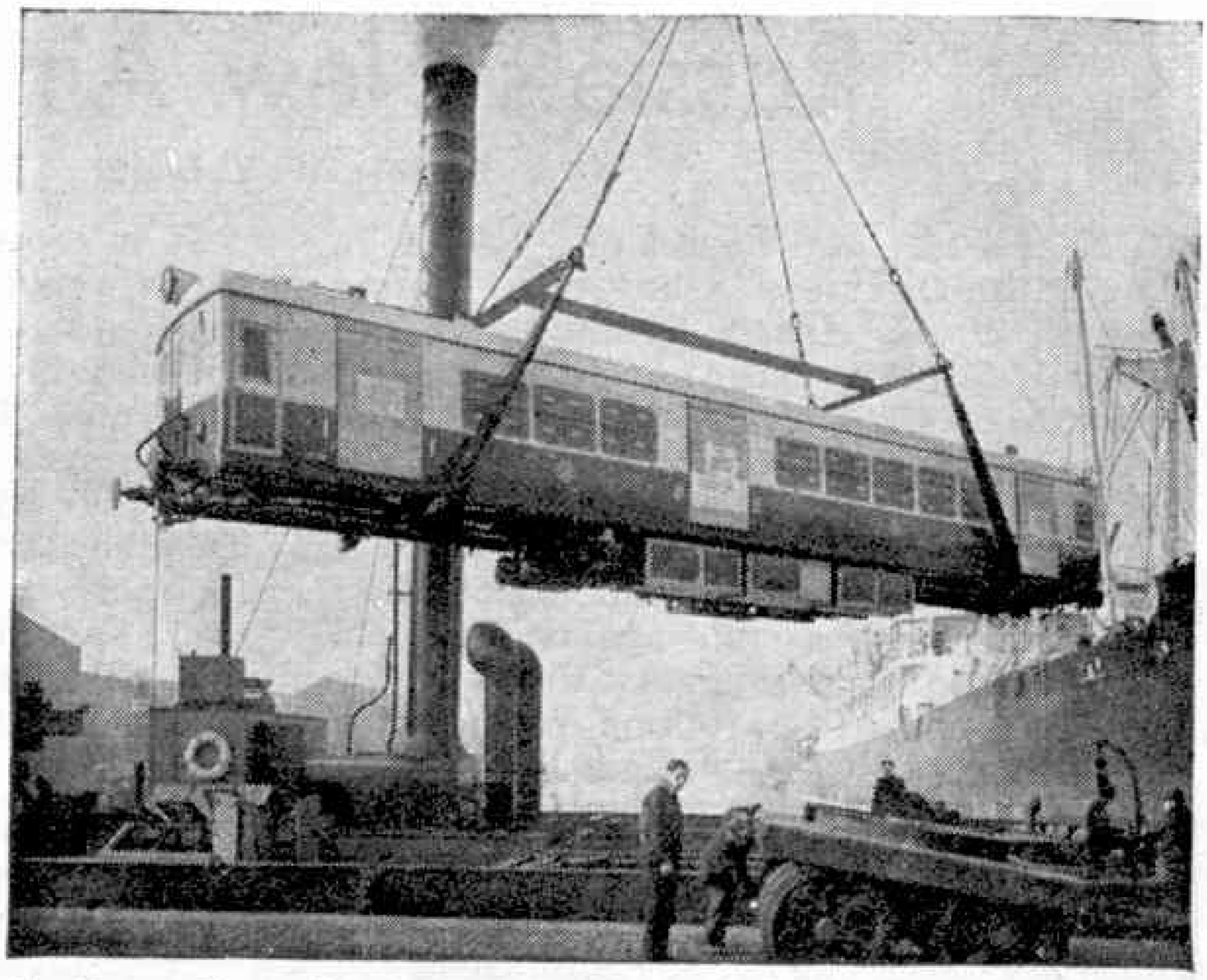
long distances with heavy loads of fully-braked wagons.

Locomotive Shed Code: Western and Southern Regions

The Western Region shed numbers run from 81 to 89. The districts with the principal depots coming first are as follows: Paddington (Old Oak Common) 81A; Bristol (Bath Road) 82A; Newton Abbot 83A; Wolverhampton (Stafford Road) 84A; Worcester 85A; Newport (Ebbw Jn.) 86A; Neath 87A; Cardiff Valleys 88A; and Oswestry 89A. In each case, sub-sheds follow in each group as customary lettered B, C, D, etc. Examples are 81B Slough; 82C, Swindon; 83B, Taunton, 83C, Exeter; 84C, Banbury; 85B Gloucester area; 86C, Cardiff (Canton); 87E Landore; 88C, Barry; and 89B, Brecon.

There are six Southern districts numbered 70A–75G. The code figure and headquarters of each are Nine Elms 70A; Eastleigh 71A; Exeter (Exmouth Junction) 72A; Stewarts Lane (London, Eastern) 73A; Ashford 74A; and Brighton 75A. Sub-sheds include 70D, Basingstoke; 71B, Bournemouth, 71E-F, Isle of Wight; 73B, Bricklayers' Arms, 73E, Faversham; 74B, Ramsgate, 74E, St. Leonards; 75B, Redhill, and 75F, Tunbridge Wells.

It may be some time before many engines in these Regions carry shed plates on the smoke-box doors.

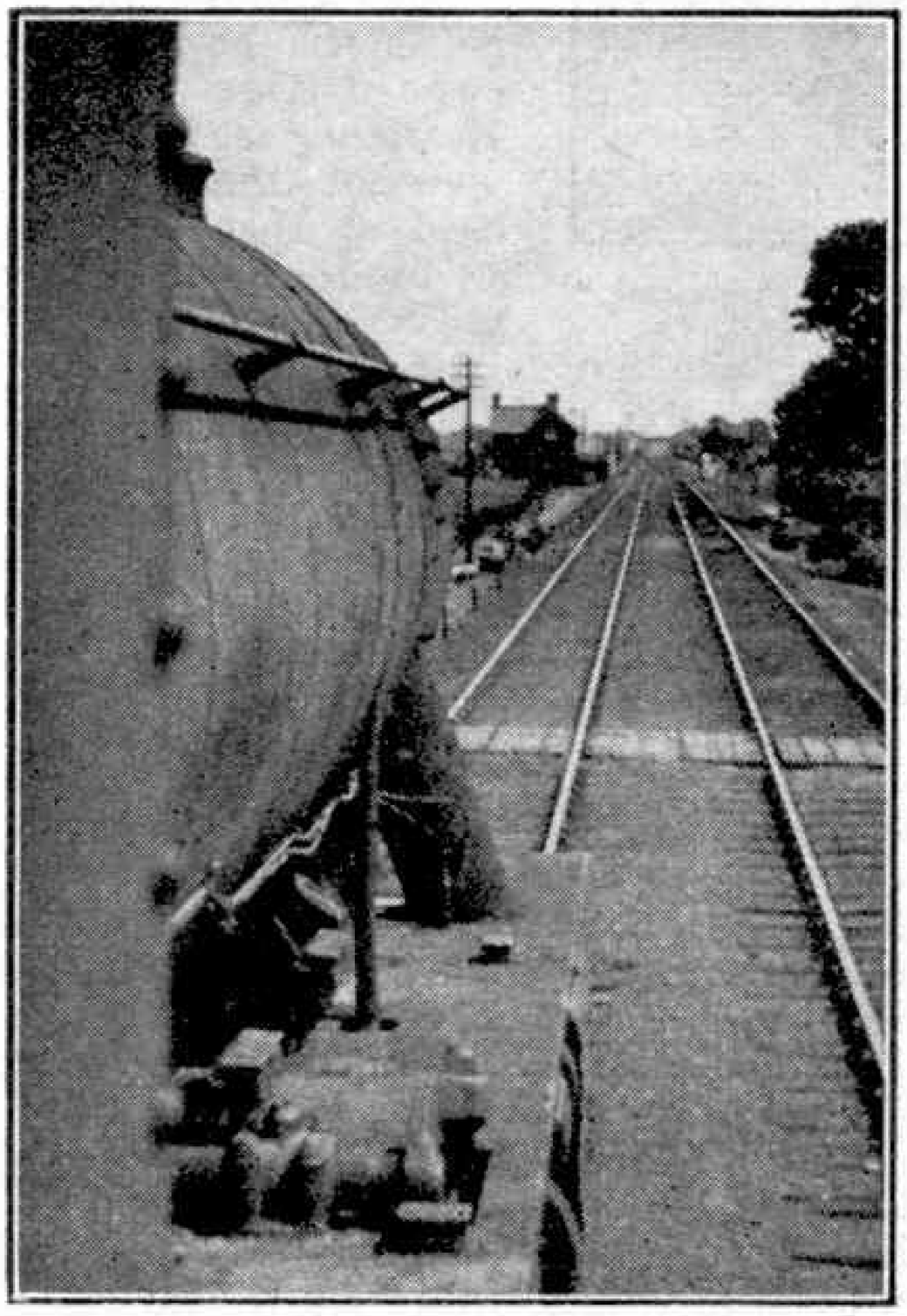


Loading a 50-ton broad-gauge motor coach on to the S.S. "Da Capo" at Manchester Docks for shipment to Lisbon. Photograph by courtesy of General Electric Company Ltd.

Southern Tidings

The following "West Country" 4–6–2s have lately been placed in service: No. 34101, "*Hartland*," No. 34102, "*Lapford*," No. 34103, "*Calstock*," No. 34105, "*Swanage*," No. 34106, "*Lydford*." Nos. 34105–110 are to be at Bournemouth shed as completed; Nos. 34101–4 are shedded at Stewarts Lane. As the last six "Merchant Navy" engines, Nos. 35025–30, have been allocated to the Eastern Division for working Continental expresses or other Kent coast trains, none of that type is now stationed at Bournemouth.

Six through turns between Exeter and Waterloo are rostered to be operated by "Merchant Navies" belonging to Exmouth Junction, Salisbury or Nine Elms sheds, crews being normally changed at Salisbury. We noticed "West Country" No. 34042, "*Dorchester*," on the Salisbury duty recently.



The view ahead from the footplate of W.D. 2-8-0 No. 77104. Photograph by R. Tharratt, Hull.

Electric Rolling Stock for Portugal

We illustrate on this page the first motor coach of an order for electric stock placed with The General Electric Co. Ltd. by the Sociedade Estoril, Portugal, being loaded on to a ship at Salford, near Manchester, for shipment to Lisbon. This order, obtained in the face of intense competition, is the first for electric rolling stock ever to be placed with a British firm by any of the Portuguese railways.

The equipment, including a mixed traffic locomotive, is for service on the 5 ft. 6 in. gauge railway electrified at 1,500 volts D.C. that runs between Lisbon and Cascais, along the northern shore of the Tagus estuary, serving en route the well-known holiday resort of Estoril. Electrical equipment for the coaches and locomotive has been supplied by the G.E.C., the mechanical parts and bodies of the all-steel rolling stock being manufactured by Craven's Railway Carriage and Wagon Co. Ltd., Sheffield.

Because of its broad gauge and large overall dimensions, the motor coach shown could not travel to Manchester by rail. The 65 ft. body, weighing with electrical equipment nearly 50 tons, was mounted on special transport bogies for road haulage, and had to follow a circuitous route chosen to avoid sharp corners and bridges unsuitable for heavy loads.

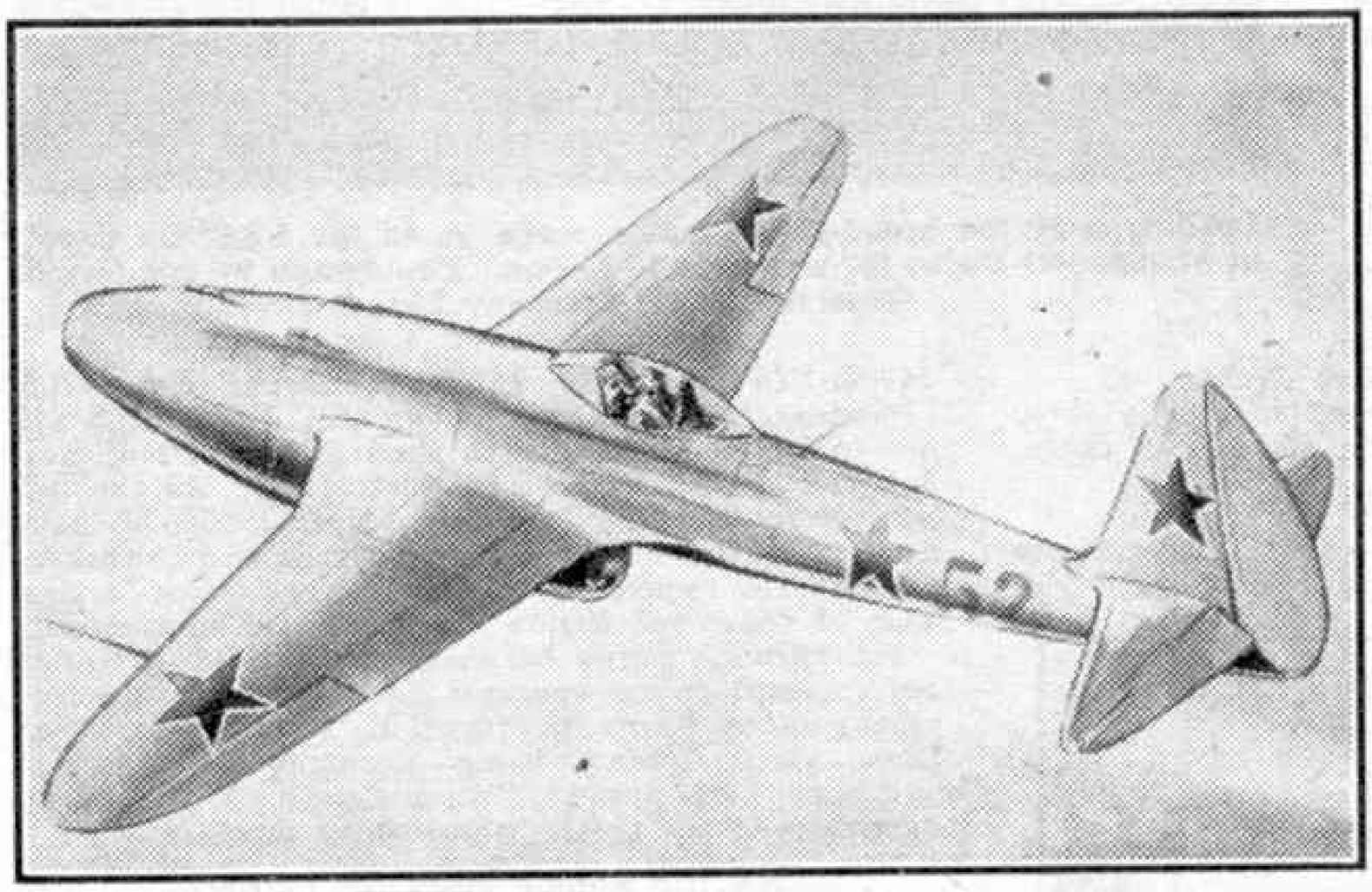
Seating accommodation is provided in the coach for 20 first class and 40 second class passengers, and there are roomy central and end vestibules. The electrical equipment is slung under the body so that practically the whole of the interior is available for passengers. Only a small section at one side of each end vestibule is occupied by the driving compartments.

Russia's New Air Force

By John W. R. Taylor

ON 11th November 1944 a "Superfortress" bomber named *"General H. H. Arnold Special"* took off from a U.S.A.A.F. base in China, dropped its bombs on the aircraft factory at Omura, Japan, and turned for home.

It was a routine mission, less exciting than most of its earlier ones, for the *"General Arnold Special"* had led the first trial "Superfortress" raid against Jap-held Bangkok, and the first against the Japanese homeland, as well as taking part in the longest combat flight in history, a 3,700 mile-attack on a refinery at Palembang, Sumatra.



Yak-15, Russia's first jet fighter. Photograph by courtesy of "The Aeroplane."

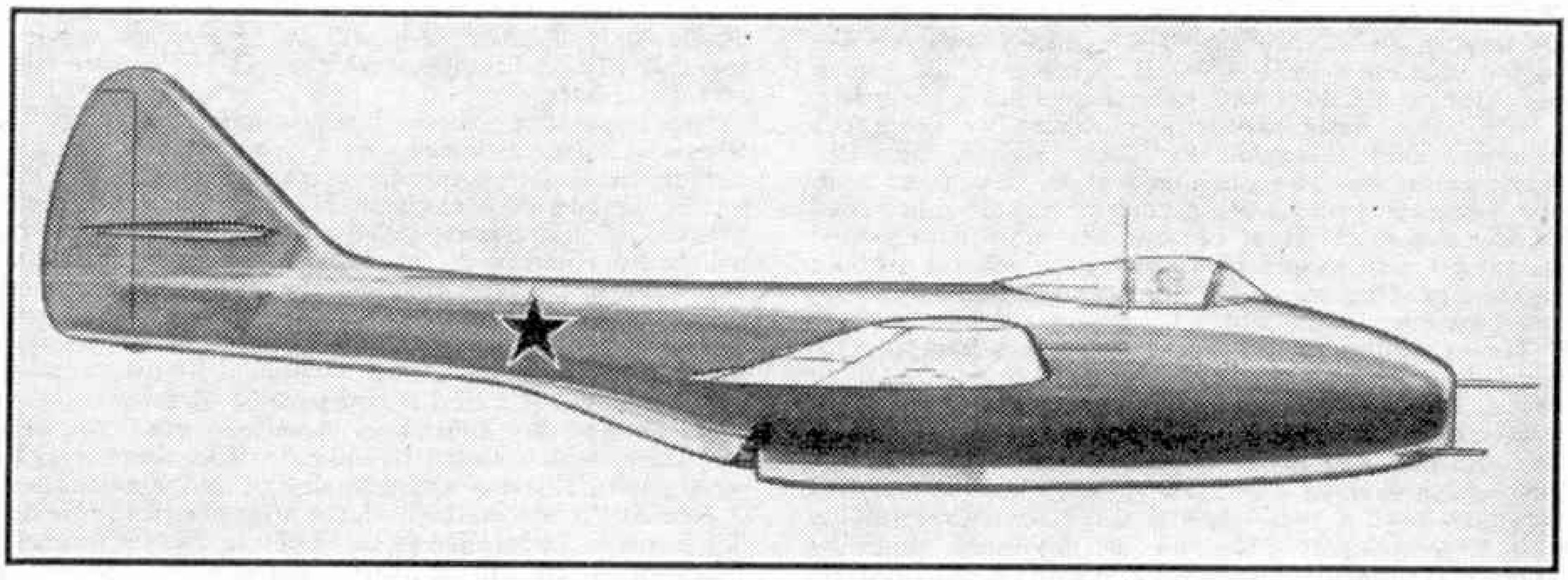
This time, however, its luck did not hold, for its pilot, Capt. Weston Price, soon realised that he had not enough fuel to get home. So he swung the big aircraft round and headed for the nearest friendly territory, near Vladivostok.

"Friendly" proved to be a misnomer, for the bomber was greeted by anti-aircraft fire and a flight of Russian fighters, which kept close escort until it landed. As Russia was not then at war with Japan, the bomber was not allowed to leave again, and its crew had to spend a period in an internment camp at Tashkent, Siberia, before returning to the United States, in company with over 100 other American airmen. The *"General Arnold Special"* remained in Russia, together with two other "Superforts" which had suffered the same fate.

It is more than likely that U.S.A.A.F. chiefs would have forgotten all about these machines had not U.S. observers been considerably shaken three years later to spot some "Superfortresses" among massed squadrons of aircraft taking part in the 1947 Soviet Aviation Day parade at Tushino Aerodrome, Moscow. There were far more of them than the Russians had ever "acquired" from America, and it was obvious that they had simply taken the *"General Arnold Special"* to pieces, designed jigs and tools to mass-produce every part, and then started their own "Superfortress" assembly line. All of which explained why Russia had tried, unsuccessfully, in 1946 to buy "Superfortress" tyres, wheels and brake assemblies from an American rubber company.

Such a move was by no means beyond the capabilities of the Russians, especially in view of their urgent need at that time for a modern strategic heavy bomber. Technically, the Soviet Air Force had ended the war five years behind the German and Allied air forces. Its aircraft were good, its pilots brave, but it had no jet fighters, little knowledge of long-range bombing and no experience in the use of such modern devices as radar for attack and defence.

These shortcomings had been of little consequence in the closing stages of the war, as Russia's 20,000 first-line aircraft were opposed only by those *Luftwaffe* units which could be spared from the more urgent task of trying to save Germany from destruction by R.A.F. Bomber Command and the U.S. Eighth Air Force. But there is little doubt that the chiefs of the Russian Air Force realised its deficiencies, and they must have been delighted when the U.S.A.A.F. inadvertently presented them with three of its finest long-range bombers, complete with full operational equipment of the highest standard.



The MIG-9 twin-jet fighter. Photograph by courtesy of "Flight."

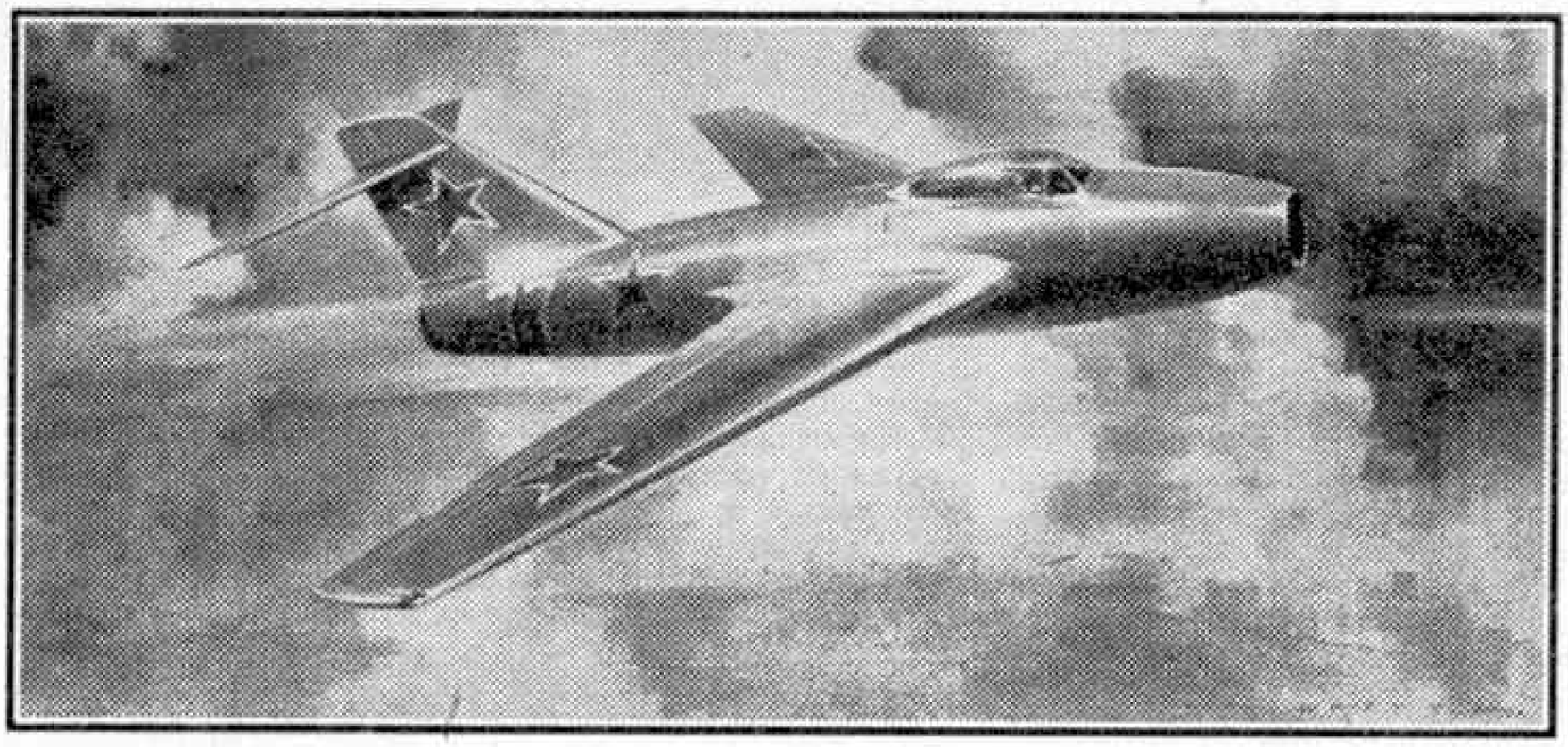
Further windfalls followed when Germany capitulated, for Russia acquired many important German research centres and aircraft factories, each with its quota of new and secret jet and rocket 'planes. The aircraft were taken to Russia for study and development, together with most of the factory equipment. In addition, hundreds of the finest German scientists, designers and craftsmen were persuaded in various ways to continue their work in the Soviet Union.

Russia thus obtained samples of some of the most advanced jet fighters, bombers and rocket weapons in the world, as well as the American "Superfortresses." Further aid came from an unexpected source when Britain agreed to sell specimens of the Rolls-Royce "Derwent" and "Nene," finest jet engines in the world at that time.

With such equipment on which to base her next generation of warplanes, plus the undoubted ability of her own designers, Russia was able to face the future with confidence, knowing that by the time her scientists had perfected an atom bomb she would have plenty of "Superfortresses" to carry it, and thousands of efficient jet fighters to protect her from counter-attacks.

Since then the Soviet Air Force has grown to be the biggest in the world, although nobody on this side of the Iron Curtain and very few people on the other side know just how big or how good it is. There is little doubt that the latest Russian jets are of very advanced design, but the real test is in the quality of their detail construction, not discernible in small-scale photographs, and in the quality of the engines under their smooth cowlings.

During the war Russia produced some good piston engines, and she must have derived much useful information from German and British jets obtained later. But even the Americans, with their immense resources and engineering skill, admit after several years of British assistance that their jets are two years behind ours. It is hardly likely that Russia has fared better. Her ultra-modern jets therefore may not be as fast or efficient in service as they appear to be on the surface.



Original drawing by Frank Wootton of Russia's latest type fighter, known to be in squadron service and believed designed by Lavochkin. Photograph Crown Copyright. Reproduced by permission of Controller of H.M. Stationery Office.

On the other hand, it would be foolish to under-estimate the tremendous advances that the Soviet has made in the last five years. Her first jet fighter, the

YAK-15, was not very spectacular, and seemed to be merely an adaptation of the well-known YAK-9 piston fighter with a 4,000 lb. Chelomey jet engine mounted in its nose and exhausting under the wing.

The same basic layout was chosen by Comrades Mikoyan and Gurevich for their MIG-9, but this single-seater has two Chelomey units, developed from the German Jumo 004, giving it a probable speed of 550 m.p.h. It is at present the most widely-used Soviet jet, and should be a quite good general purpose fighter, as it mounts a 30 mm. cannon and two .5 in. machine-guns in its nose.

Newer and more advanced types are coming into service, including the YAK-17, which is similar in layout to the American "Thunderjet" and is probably powered by a Russian development of the "Nene." In addition, the MIG team have developed an improved version of the MIG-9, while Lavochkin has designed both a twin-engined single-seater resembling the Messerschmitt 262, and an advanced single-jet type with sharply swept-back wings, which appears to be in the same class as the North American F-86 "Sabre," holder of the world's speed record. But, as I suggested earlier, "It's what's under the bonnet that counts."

A factor that should not be overlooked in assessing the worth of all these Russian fighters is their armament of heavy calibre guns such as the 30 mm. cannon, for this gives them great advantage both in weight and range of fire compared with, say, the normal British 20 mm. cannon or the American .5 in. machine-gun. In addition Russia is known to be experimenting with guns up to 55 mm. calibre, and rocket guns based on German designs.

Two vitally important deficiencies seem to be lack of a jet all-weather night fighter, and continued lack of air defence radio and radar equipment, apart from early types captured from the Germans. These can be of immense importance, as we know from experience, for if British scientists had not perfected methods of ground-to-air fighter control and early warning radar by 1940 we could never have won the Battle of Britain.

One way of reducing the need for radar is of course by the use of rocket-propelled target defence interceptors, which need not take off until enemy bombers can be seen approaching. It is therefore significant that the Soviet Air Force has in service local defence squadrons equipped with rocket fighters developed from the little tailless Messerschmitt 163.

Behind the jet-fighter squadrons, which total several thousand aircraft, is a far larger force of reserve piston-engined fighters, comparable with any British or U.S. single-seat piston-engined types and by no means to be ignored. The whole fighter defence system is under the command of Air Force Guard Lieut.-Gen. Vasili Stalin, son of Russia's Premier.

The Soviet bomber force does not appear to be anything like so advanced technically as the fighter groups. On the other hand, it is wrong to judge it by Western standards, for the primary role of Russia's wartime air power was tactical support of her armies in the field, and post-war development of a strategic bomber force has inevitably been slow and difficult.

Nevertheless, it has been estimated that the Soviet Air Force possesses some 2,000 four-motor bombers, mostly of the Tupolev-built "Superfortress" type, backed by wartime PE-8s. The first Soviet jet bombers are also well under way, including a twin-engined Tupolev design and a promising four-jet type by Ilyushin.

In addition, the well-known TU-2 and PE-2 twin-motor light bombers are still in large-scale service, together with thousands of wartime I1-10 "Stormovik" attack aircraft.

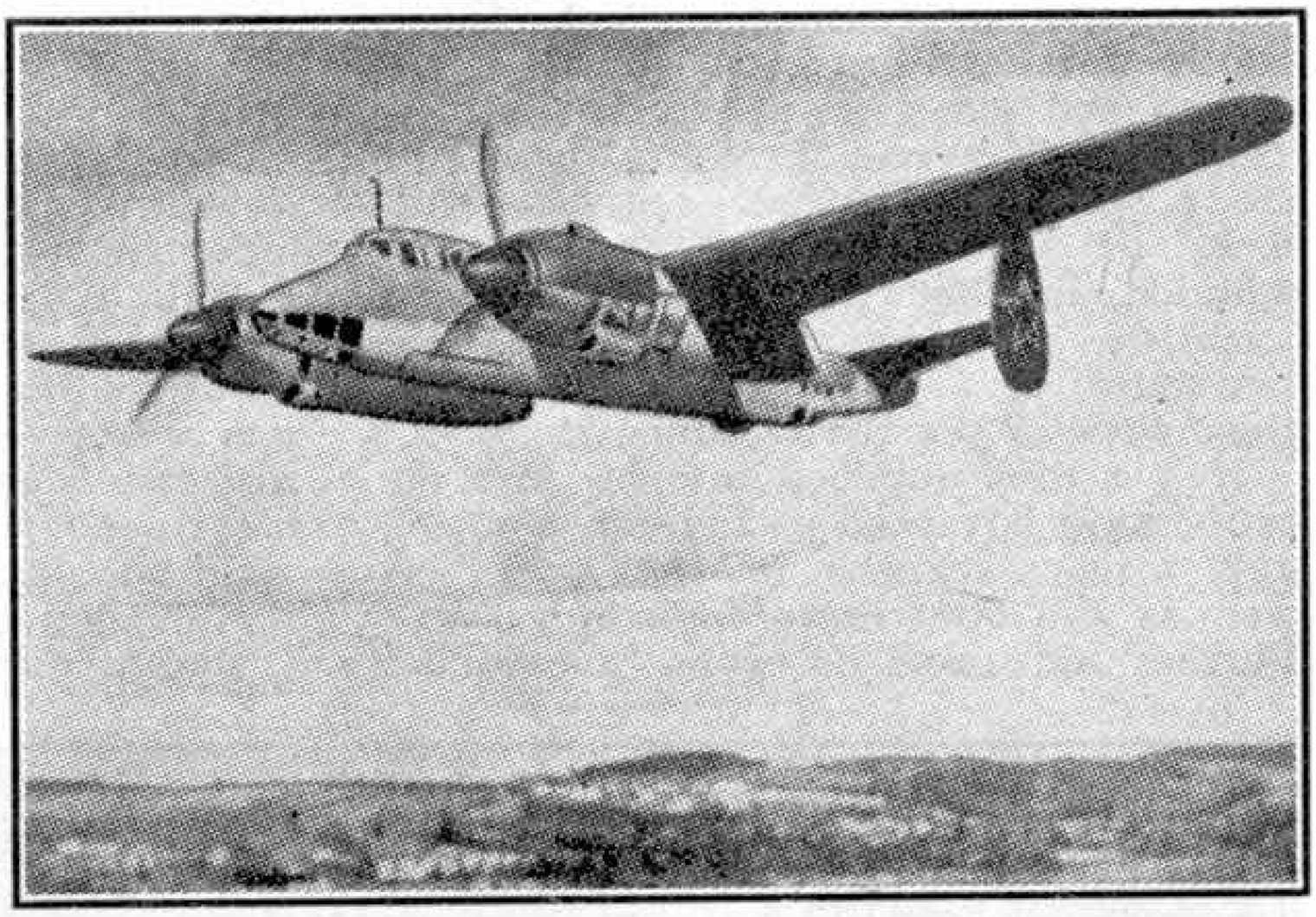
Supplementing these operational warplanes is Russia's vast airborne army of 150,000 trained parachutists, with some 3,000 transport aircraft. The latter include four-engined I1-18s and Soviet-built "Dakotas," but consist mainly of twin-engined I1-12s, which are roughly in the same class as the "Viking" but have a tricycle undercarriage. I1-12s also form the mainstay of the civil airlines of Russia and some of her satellites, and one has been operated to this country by Czech airlines. British experts who inspected it found it comparable in most respects with present-day British or American medium-range air liners, which seems to indicate that there is little wrong with Russian airframe design and construction.

Recent "guesstimates" of the strength of the Soviet Air Force have totalled from 15,000 to 25,000 aircraft, maintained by an industry capable of producing between 25,000 and 40,000 aircraft a year. Whatever the true figures may be, they add up to a formidable weapon for attack and defence.

What of Russian progress in "push-button" warfare? Here the position is even more vague, but it should not be forgotten that the Russians pioneered the use of rocket weapons in World War II, surprising even German experts who discovered one huge Crimean store-house filled with no fewer than ten types of rocket bombs which the Soviet considered too secret to use at that time. Now, with the help of German experts, plus specimens of almost every type of rocket missile under development in Germany in 1945, they may well be in advance of either Britain or America.

At the moment they are believed to be concentrating on production of improved types of V.2, with longer range and more powerful warhead; versions of the V.3 *Schmetterling* ground-to-air and Henschel 298 air-to-air anti-aircraft rockets; and the Hs 293 radio-controlled anti-shipping rocket bomb.

That is about as much as we know about present-day Soviet air power, and quite a lot of it is, admittedly, intelligent deduction from the few pictures, facts and figures that have slipped past the Iron Curtain. What does it all amount to? Is Russia building a giant air force for a sudden all-out onslaught on the Western Powers, or is the whole of Russia's gigantic aeronautical effort prompted by her own fear of attack? Unfortunately, only Stalin and a few members of the Politburo could answer those questions.



The Tupolev TU-2 twin-engined light bomber.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"TEACH YOURSELF CRICKET"

By F. N. S. Creek
(English Universities Press Ltd. 4/6)

The fine old English game of cricket is rightly the subject of a volume of the "Teach Yourself Series," previous volumes in which have already been reviewed in the "*M.M.*" It is perhaps doubtful if the reader who tries to become a player in the full sense of the word is really teaching himself, for in the practice and manœuvres that he will find himself carrying out he has Mr. Creek's knowledge and experience to guide him. This is a good thing, for the author has undertaken his task in the right spirit and is complete and commendably thorough in his explanations of technicalities—a side of the game that needs more careful attention than is perhaps given to it by most boys—and in his admirable dealings with batting, bowling, fielding and wicket keeping. It is particularly good to see an excellent chapter on running between the wickets, an art that can win or lose matches; with a section on umpiring and another on "Learning the Game by Scoring," based on the well-known fact that the score book or score card gives most youngsters their introduction to the real game.

In the course of his book Mr. Creek gives a remarkable amount of general information on cricket, including a brief history of the game. He illustrates the principles that should govern the player, batsman, bowler, wicket-keeper or fieldsman, by excellent diagrams, including a particularly interesting series showing how the ball should be held to produce various types of delivery. There are also 12 excellent half-tone reproductions representing cricket in action.

"A.B.C. OF BRITISH RAILWAYS LOCOMOTIVES" Parts 1, 3, and 4

(Ian Allan. 2/- each)

The three parts of this useful "A.B.C." booklet deal with locomotives of the Western, London Midland and East and North Eastern Regions respectively. Part 2, covering engines of the Southern Region, was reviewed in the "*M.M.*" for February of this year, and the four parts together form a complete list of present British Railways locomotives, steam, electric and diesel. All are arranged in the now familiar "A.B.C." style, giving a wealth of information in handy form, including numbers, names and classes, and summaries of dimensions. Illustrations are plentiful and in good style.

Copies of the booklets can be obtained from booksellers, or direct from A.B.C. Books Mail Order Department, 33, Knollys Road, Streatham, London S.W.16, price 2/2½d. each including postage.

"CLOCKMAKING PAST AND PRESENT"

By G. F. C. Gordon, M.A., A.M.I.C.E.
(Technical Press Ltd. 17/6 net)

The late G. F. C. Gordon wrote the original edition of this book in 1924, and here we have an enlarged version by Mr. A. V. May, who has brought it into line with modern requirements.

Historical details are given to show how British clocks have developed, and this aspect of clockmaking is dealt with at length in a series of chapters on lantern and bracket clocks, and on long case clocks, which are usually known as grandfather clocks. There are notes on various makes and styles, the design of clock hands and other details, with a section on restoration and repairs. Church or turret clocks provide another interesting topic, and extracts are given from Lord Grimthorpe's well-known book on this subject, now out of print.

The book is illustrated by many full page plates, showing clocks of historic interest, and by line drawings.

"THE LONDON MOTOR BUS 1896-1949"

By R. W. Kidner
(Oakwood Press. 4/6)

It would be difficult to think of London without its cheerful red motor buses. Not only enthusiasts, but also many who are not specially interested in motor transport, will be glad to learn how, when and where the motor-bus system of the Metropolis started, and how it developed between 1896, when self-propelled vehicles on the roads were freed from restrictive legislation, and the present day.

Here is a booklet that tells this story, giving details of the competing interests that have been concerned and of the varied vehicles used by them—petrol, petrol-electric, and "steamers." Illustrations enable the reader to trace progress from the days of stark simplicity in passenger and crew accommodation, solid tyred wheels and general slim construction, to the characteristic London Transport buses of to-day, with their ample proportions, comfortable seating and pneumatic-shod wheels. The contribution of the motor bus to the war effort in the two world conflicts is described, and the effect of wartime and post-war conditions on the bus fleets at home makes interesting reading. Appendices summarise information on types, marks and codes for the London bus throughout its history.

"CYPHER K"

By "Taffrail"
(Brockhampton Press Ltd. 5/- net)

"Taffrail," or to use his own name Capt. Taprell Dorling, D.S.O., R.N., is already well known as a writer who has lived through enough adventures to keep his pen busy for a lifetime. Whatever he writes is not only attractive in itself, but is also completely accurate in every detail of life at sea, whether he is dealing with a battleship or a small private yacht.

"*Cypher K*" is an excellent example, full of exciting incidents, and with characters who carry conviction to the mind of the reader. Its action begins at Sheerness, with the theft of a secret code and other confidential documents from the cabin of the commander of a British cruiser. The search for these brings in our hero, who follows clues that take him in his yacht "*Gypsy*" from Southampton waters to the Cornish coast near Lands End. At first the mystery deepens, but at last everything becomes clear and a fight at sea in a blaze of searchlights brings to justice a gang of smugglers as well as a traitor and spy.

This thrilling story is amply illustrated by good line drawings.

"SANDAL ASH"

By P. A. Cox
(Harrap. 6/-)

Sandal Ash is a village on the borders of a small forest, and here is the story of the Singletons and the Trents, all very real children who live in it. To begin with these are friends, but by accident they are split into opposing camps, who carry on a country warfare, one group making its headquarters in an old mill and the other in a deep hollow under an overhanging rock. The old mill houses more than the Trents, however, and eventually the children find themselves on the trail of a villain who has burgled several houses in the neighbourhood, with unexpected results.

For our younger readers this is an excellent story, full of zest and excitement and it is interesting to find that the author began to write it when she was only 15. There are two maps to illustrate the campaigns and the mystery, together with black and white illustrations by the author herself.

Brock the Badger

By R. H. Ferry

AT the time of the Roman invasion the soldiers scratched pictures of badgers on their barrack walls, and in our many town names prefixed "Brock," the old world name for badger, we have proof that these animals were at one time very common. Throughout the ages they have been dug up ruthlessly, and they have been baited callously by trained dogs, yet to-day they have endeared themselves to us and are left to enjoy life unmolested wherever they choose to live.

We are fortunate that badgers are now on the increase, and families of them are inhabiting setts in the vicinity of big cities. These homely and entirely harmless animals give our countryside an old-world, almost mediæval quality. In these days of hustle and bustle it is a treat to find an animal built for comfort rather than speed!

One can tell a good deal about an animal's habit of life and character by its condition, shape, and the length of its legs. The badger has a short-legged, tramp-like shuffle, and is among the very few predatory animals that are fat throughout the year. In his make-up he has none of the "tucked up" appearance of the ever hungry fox, or the long hind legs of the speedy hare, none of the sadistic stealth of that master killer the stoat. Brock has always a round and ungainly, but comfortable appearance, which no doubt comes from sleeping all day and eating all night.

Badgers will eat almost anything, wasp's nests, slugs and insects, young birds, and rabbits purloined from traps, and they are inordinately fond of honey. On this good country fare they grow fat, and their hams are delicious to eat. In the war a gypsy sold me a badger ham, cured with honey in place of the unprocurable brown sugar, and it was excellent both in flavour and texture.

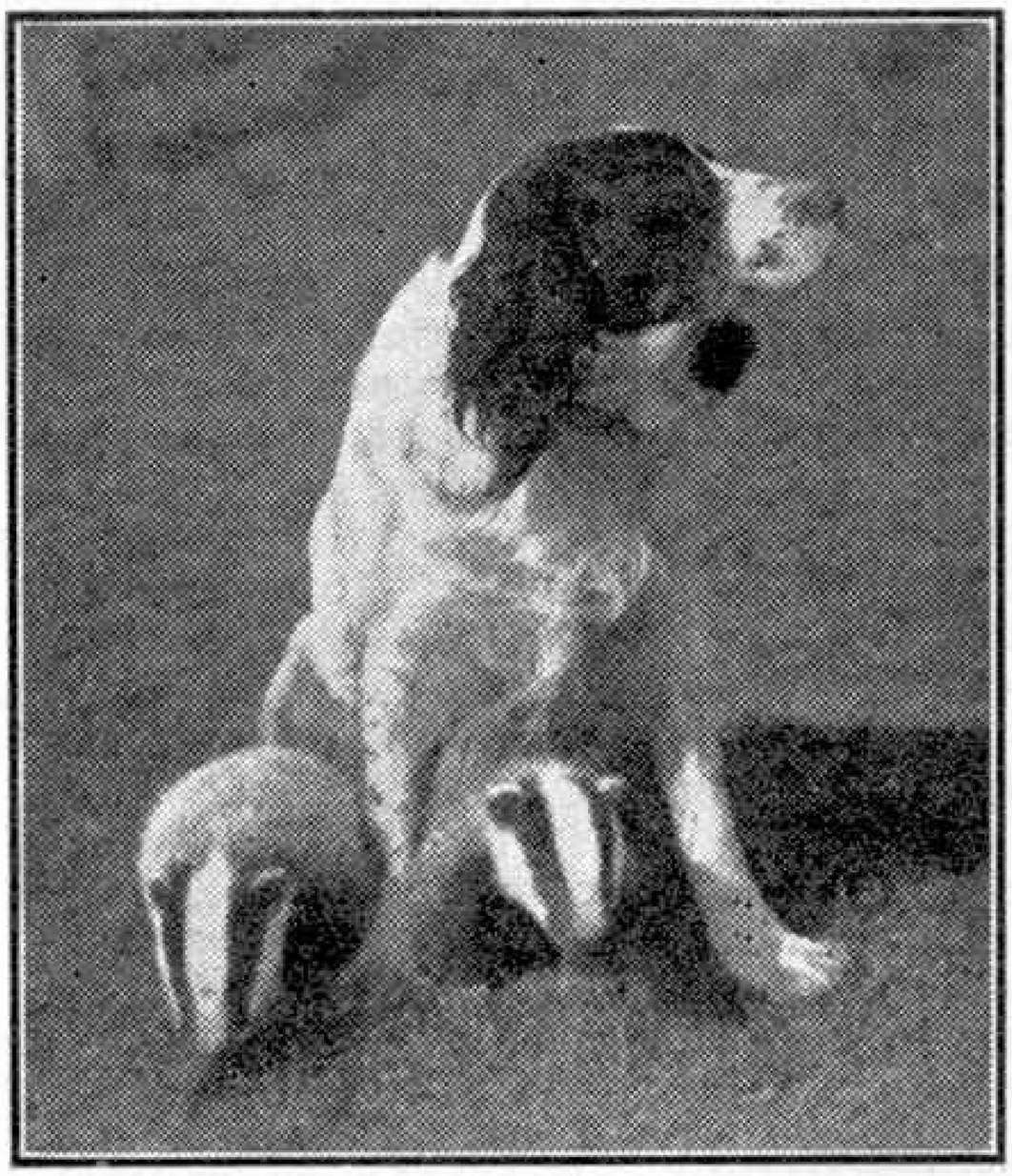
It is a great pity, however, even in these days of meat rationing and shortages, to destroy these uniquely interesting animals either for food, or for the soft fur, popular with shaving brush manufacturers because it is reputed to be anthrax free.

The reason for the badger's "rarity" is that it lives a nocturnal life. At night it comes out from its sett or deep hole, sniffs the air cautiously for some moments, and then shuffles off with contented grunts to forage till dawn, when the blackbird heralds the day from the top of the highest tree. If a roaming beast comes on a trap in its path, he simply rolls upon it, thus harmlessly springing it, the iron teeth being unable to get a grip on the long grey hairs.

There is no reason why anyone who knows the locality of a badger sett should not see the family sally forth on a moonlit night, or watch them return, dew drenched, in the early dawn. If it is not certain that the sett is occupied, a little fine sand, sprinkled on the earth platform at the entrance a few days before watch is kept, will tell the tale and save disappointment. Badger spoor is unmistakable, as the animal steps flat-footedly. It remains only to keep quiet, still, and down wind from the hole, so that the human scent does not give away one's position.

In spite of their long residence in this country there is a lot yet to be learned about badgers, so that a keen amateur watcher may add much of appreciable value to what we already know. It is not definitely agreed if the male badger is polygamous, or whether he is faithful

A badger digging out insects hidden on the mossy covering of a fallen tree. Photographs by Oliver G. Pike.



Unusual friends. A spaniel with two badger cubs she has adopted.

to his wife for life. Neither do we know exactly the season of actual mating. In quite recent times it has been discovered that these friendly bear-like creatures live a community life in deep underground workings, where there are passing places in the passages for down going and up coming traffic. In the spring the sett is thoroughly spring cleaned, the old bedding being brought up and renewed with fresh grasses and bracken. To do this the badger takes an "armful" of grass beneath its chin, and drags it down, descending backwards. This bedding gives off heat in the winter, and acts as a kind of central heating.

By the well trodden paths between setts we know that colonies of badgers visit each other, whereas rabbits in their burrows are very unfriendly to visitors seeking temporary shelter. Country people have known for some time that badgers feed their blind and sick underground, but perhaps the most outstanding sight seen in recent years by a very few naturalists was a "badger's funeral." It appears that badgers carry out their dead and inter them in a burial ground after a solemn moonlight procession.

At night, in the shadows of the trees, badgers become ghostly creatures, and because of their blood-curdling cries, many eerie stories of their ferocity are told in remote rural districts. These imaginative fireside yarns are quite untrue. The badger, however, being unable to run fast, will always stand and fight it out courageously with an adversary. It will certainly not attack a human being unless cornered or provoked. Until quite recent years one commonly heard in the country that badger's legs were longer on one side than the other to enable it to run on steep hillsides where the sett is sometimes situated!

Young badgers make excellent pets. They never grow treacherous, and with a little training become as docile and friendly as dogs. It is possible to take a badger pet on a lead in traffic crowded streets, even on a bus, with perfect confidence in its good behaviour and clean habits. It is fairly easy to catch a youngster by placing a sack, fixed at the neck with a running noose, in the mouth of the hole, when the family is out for the night. The first youngster home in the dim light of early dawn runs headlong and full tilt into the sack, and "bags" itself painlessly and harmlessly. The sack must, of course, be attached with a cord to a peg well driven into the ground, or to the stump of a near-by bush. The diet is the same as that of a dog, but there is no real need to cook any offal that is included.

It is strange that so many wild animals, even those with thick warm coats, when adopted as pets suffer from cold, and soon become unhealthy if kennelled under damp conditions. Though the badger in the wild state lives a greater part of its life underground, where the earth must be wet in the winter, it is (*Continued on page 286*)

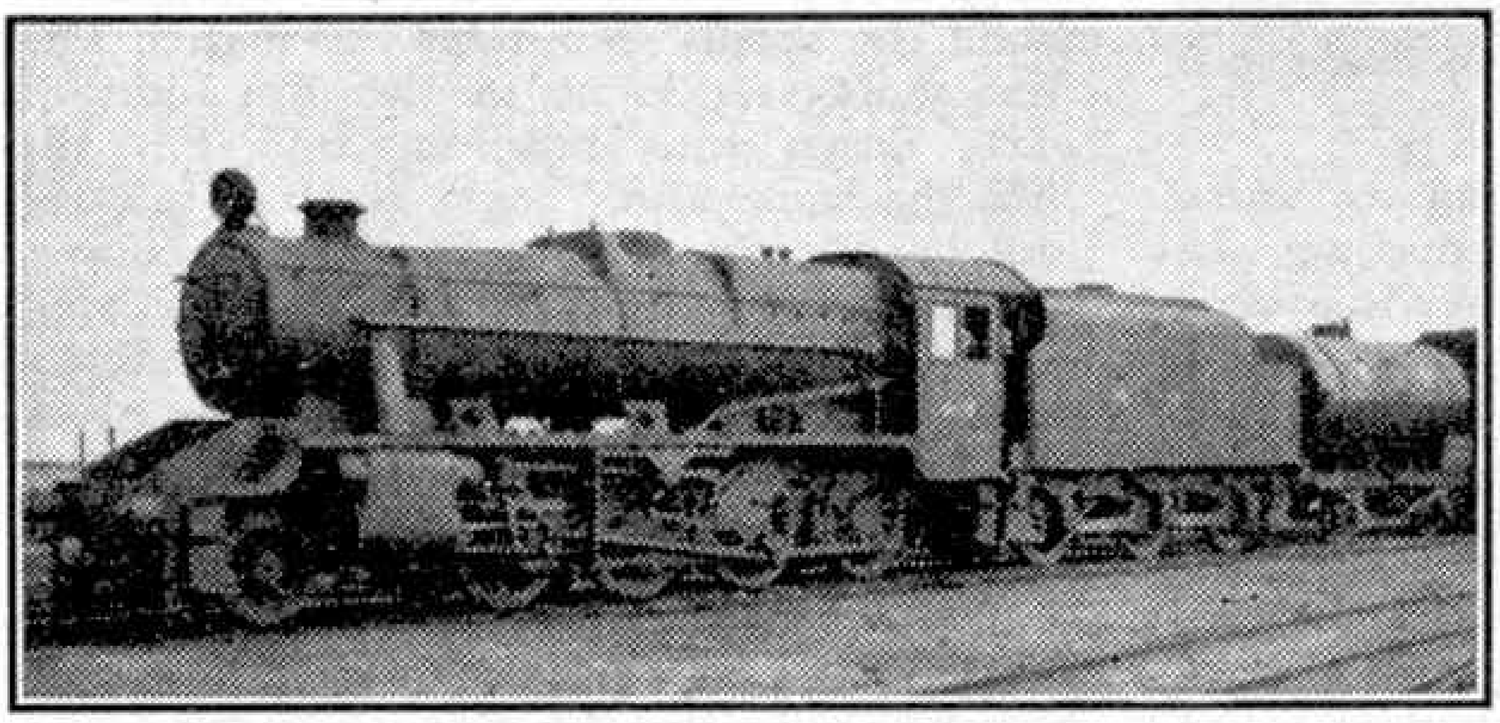
A badger pair outside their lair or "sett."

Shipping W.D. Engines at Port Said

By D. Stewart Currie, G.I.Mech.E., G.I.Loco.E.

DURING the recent war many L.M.S. type 2-8-0 Class "8F" engines were on service in the Middle East. The majority of these engines had been built for the Ministry of Supply by private firms in 1941 and 1942, but a few were taken over from the L.M.S. at the beginning of the war. They all gave yeoman service in various Middle East Countries, and with the cessation of hostilities they gradually found their way to depots in Palestine and Egypt for repair and storage.

In 1947 an Inspector from the C.M.E. Department of what is now London Midland Region, British Railways, paid a visit to the Middle East and carried out an inspection of the engines. As a result of this, as mentioned in *"Railway Notes"* last November, it was decided to return 39 engines and four spare tenders for use on the home railways.



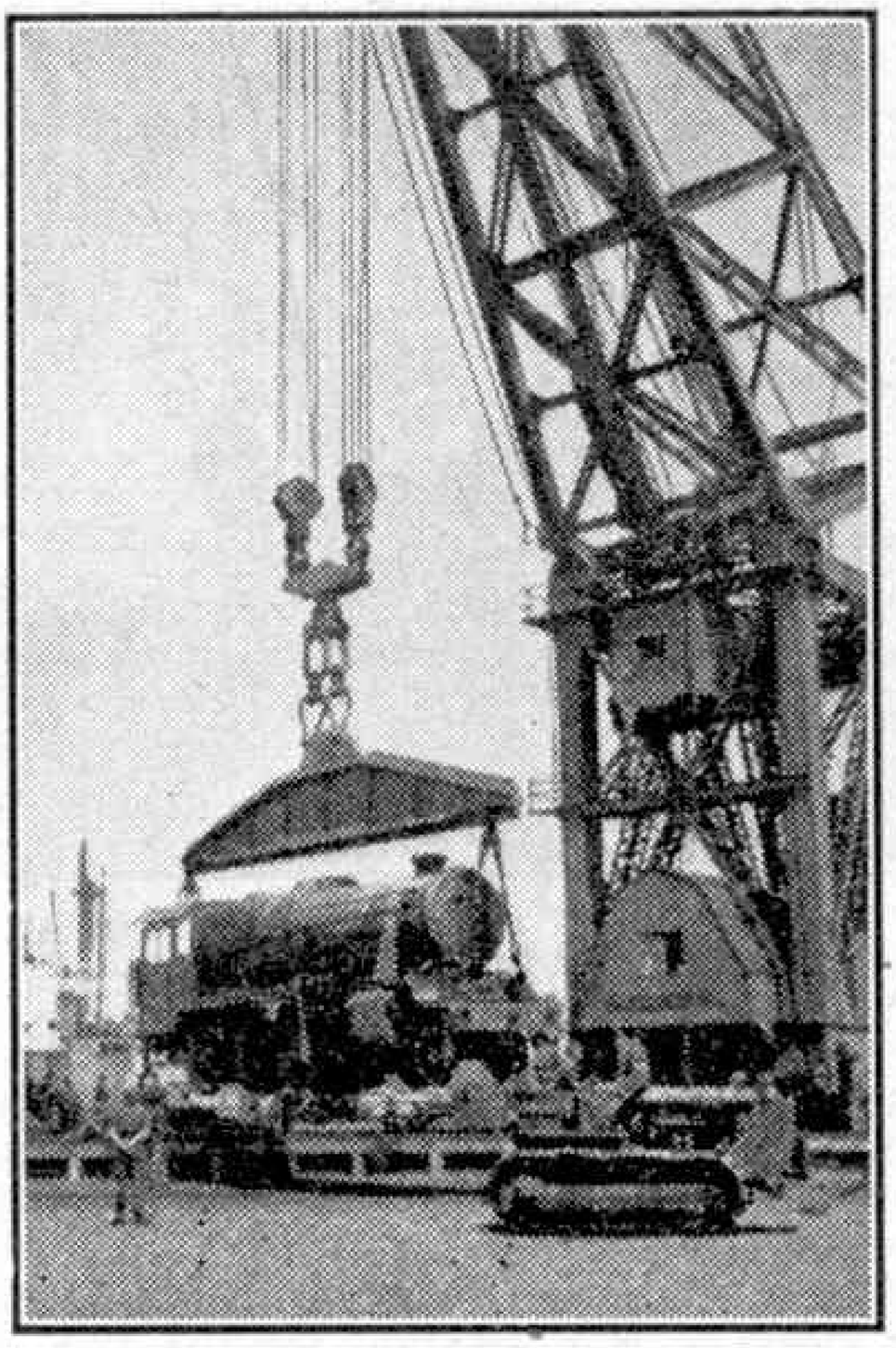
A Stanier 2-8-0 locomotive on W.D. service at Suez. Additional water for desert runs is carried in the tank wagon behind the tender.

In the meantime the evacuation of Palestine had commenced, and the engines stored at Sarafand and Azzib (in Palestine) were brought down to Suez by goods trains. This trip took on an average six days, and on at least two occasions the engines arrived at their destination with cab windows smashed and bullet holes in the cab sides, thus showing the reception they had been given by Jews and Arabs en route.

Once the engines were stored together at Suez they were prepared for their long trip back to this country. Many details had to be attended to, and the Egyptian State Railway Authorities were consulted about the running of the engines from Suez to Port Said, a distance of 90 miles, for shipment. The District Traffic Inspector of the E.S.R., Assiz Bey by name, was very helpful, and gave permission for the engines to be run in batches of four, one in steam towing three dead. Sapper train crews were to be in charge, but an E.S.R. conductor would travel with each train. The date fixed for the first train to travel to Port Said was 24th February 1948, and as that date approached, the engines were marshalled into their trains ready for the trip north.

One of the first batches to go consisted of No. 70395 in steam, hauling Nos. 70363 and 70314 dead, also two spare tenders, and it was with this train that I made the journey to Port Said. A "path" had been arranged with the E.S.R. for 6.0 a.m., so at 5 o'clock I went over to the sheds and joined the driver, Sapper Macdonald, in a last look round. Everything was in order, so we climbed up into the cab ready for the trip. The engine was in good condition, as she had recently been overhauled in the workshops. The standard oil-burning apparatus was fitted, having the burner at the front end of the brick-lined fire-box; and as I looked through the peep-hole in the fire-door I could see the long tongue of flame sweeping back and striking the wall below the door.

At 5.15 a.m. we moved slowly out of the yard and down the military line to where it joined the E.S.R. main line at Suez Cabin No. 1. There we stopped at the home signal where we were joined by our conductor, who climbed aboard and introduced himself as Tewfik. He spoke practically no English, but just beamed happily at everyone. Just then we got the road, and Tewfik motioned to us that we should be on our way. Macdonald opened the regulator, and No. 70395 moved slowly forward on what was to be her last journey in the Middle East. Soon we had left Suez behind, and ahead we could see nothing but the track stretching to the horizon. Speed was not high on account of the load we were hauling, and we slowly made our way towards Port Said, passing through such wayside



A 150-ton floating crane lifting W.D. 2-8-0 locomotive at Port Said.

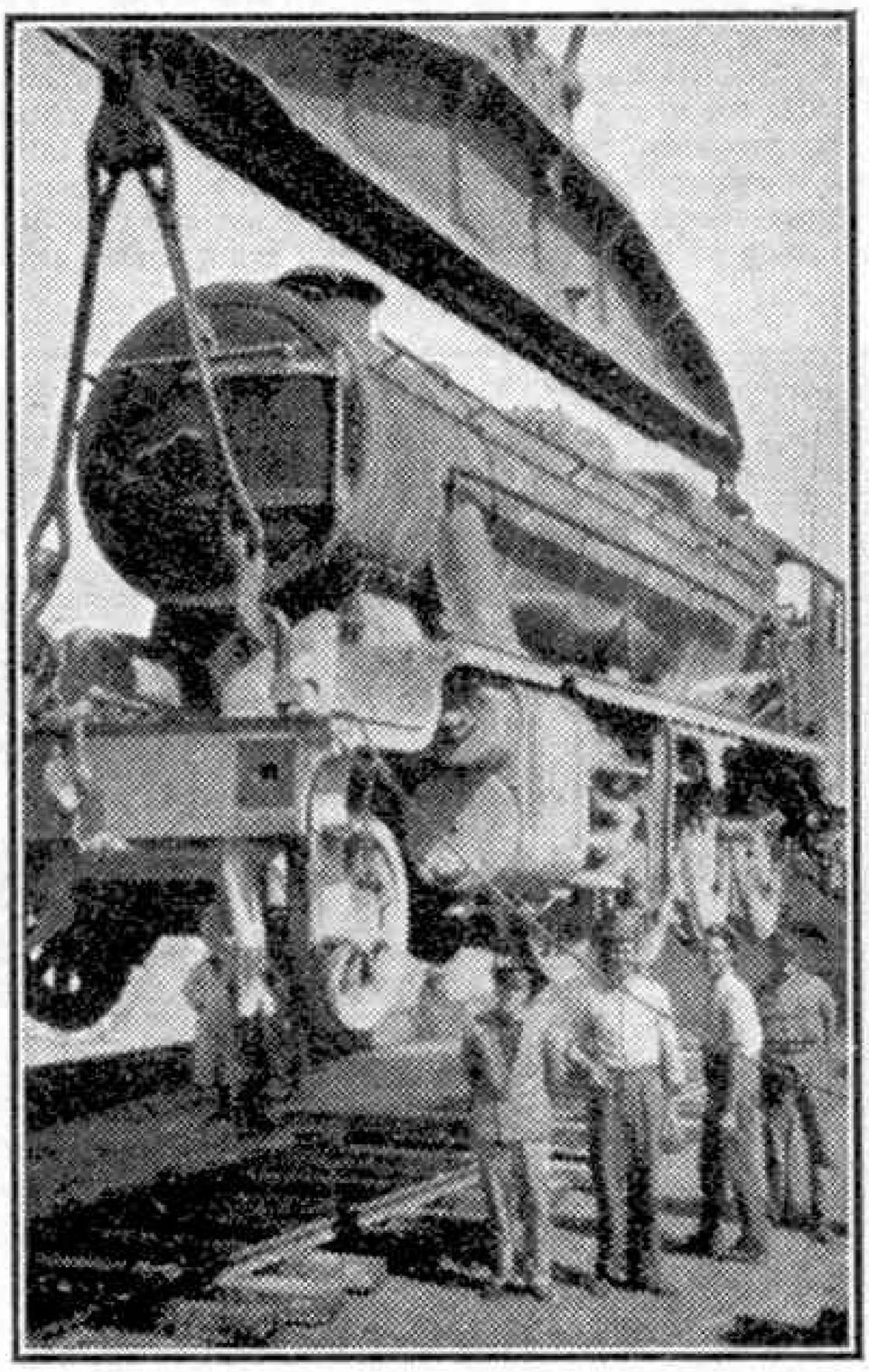
stations as Shallufa, Geneifa, and Fayid.

We stopped for water at Ismailia, and as we stood there we were notified that we were to draw forward into the siding to let the "*Cairo Port Said Express*" through. Shortly afterwards this train drew up in the station, with one of the new Canadian-built 4–6–0 locomotives on the head. The engine took water, then with the usual Middle East display of Arabs in flowing robes shouting and running to and fro, the "passenger" was off once again.

A few minutes later our signal came "off" and we were once more allowed to proceed. The line now ran parallel to the Suez Canal, and we were thus afforded an excellent view of several merchant ships proceeding along the Canal at the regulation 7 knots. Up to the present we had been running on double track, but after passing El Firdan, where we saw the wreckage of the railway swing bridge, the line became single and our conductor attended to the catching of the tablet from the signalman. Kantara West was our next station, and after passing through the busy yard there we settled down for the last lap to Port Said.

At last the Port Said swing bridge came in sight over the horizon, and as we rumbled over it a few minutes later I saw the docks lying ahead. We drew gently to a halt at the dockyard gates where we said farewell to our conductor, Tewfik. Then we ran slowly along the quayside to stop under the shadow of the 150-ton floating crane which belongs to the Suez Canal Company. The fitters were waiting there, and as we climbed down they were already at work, starting to strip No. 70395 for her sea journey. The fire was put out and the tender was drained of oil fuel and water. Then the draw-bar between engine and tender was uncoupled and a bulldozer drew the tender away.

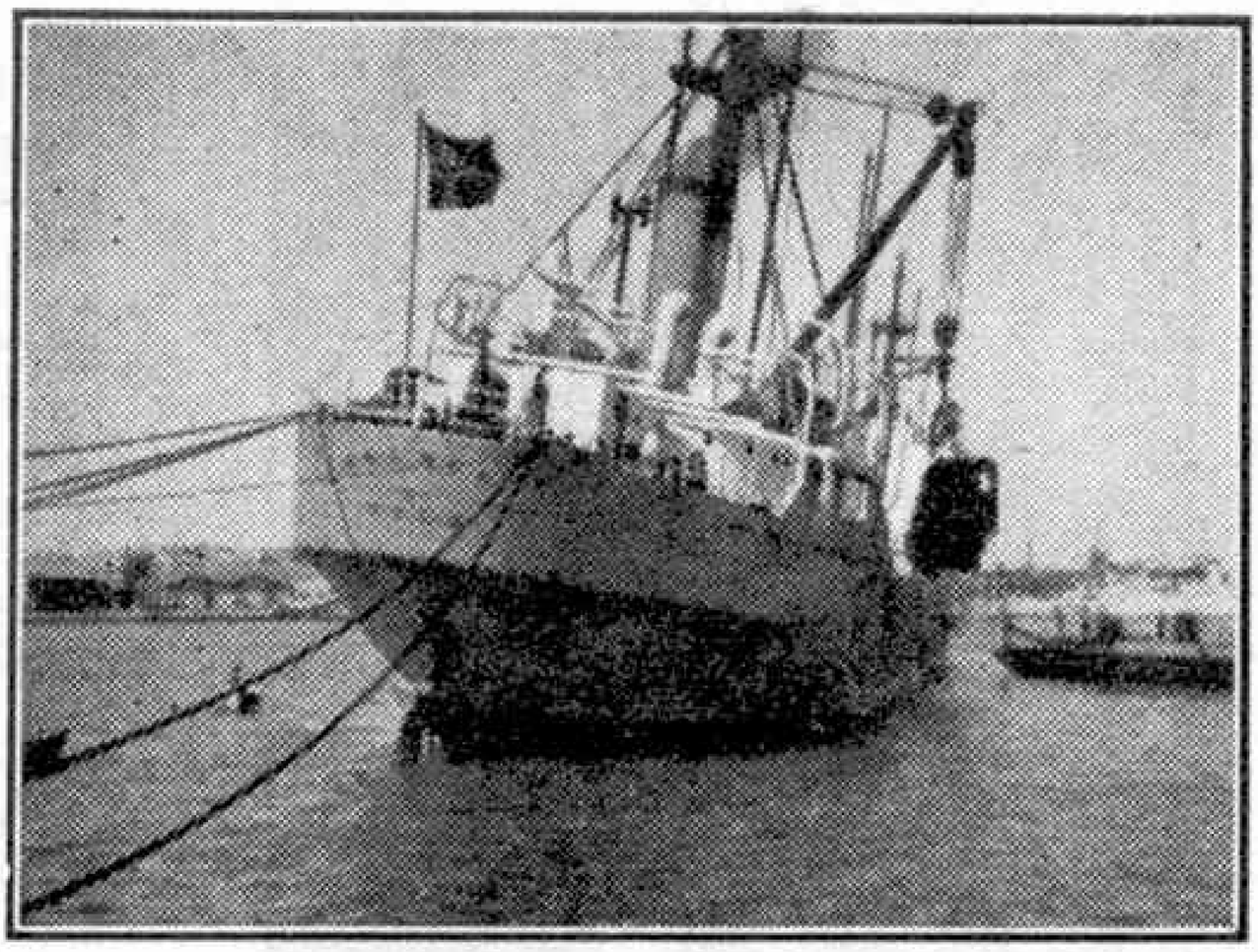
Next day the boiler was emptied, and connecting and coupling rods were removed. Crank pins were greased and wrapped in canvas, and a cover was fitted on the chimney. While this was going on the floating crane was dealing with the other engines that had been brought up from Suez. A large lifting beam was slung on the crane hook, and this was attached to the frames of the locomotive at the front end, and to the buffer beam under the cab. The engine was then taken aloft with the greatest of ease, swung round until she was over a "Z" Craft (Landing Craft) which had railway track laid on the deck, lowered



One of the engines slung from a lifting beam being lowered on the deck of a "Z" Craft.

neatly on to the rails and secured firmly. The "Z" Craft then took its load out to the S.S. *"Belnor"* which was lying at anchor in the harbour, and when it came alongside the *"Belnor's"* crew took over.

The ship was fitted with a large "Jumbo" or derrick amidships, and once the lifting tackle was attached to the engine the winches began to turn, and as the cables took the strain the whole ship heeled over under the weight. When finally the wheels of the engine were clear of the landing craft's deck the *"Belnor"* had a list of 11 degrees. The locomotive was raised high enough to be clear of the ship's side, then swung inboard and lowered down into the hold, where it was lashed securely on rails running the length of the ship. The loading went on all day until by evening the holds were full.

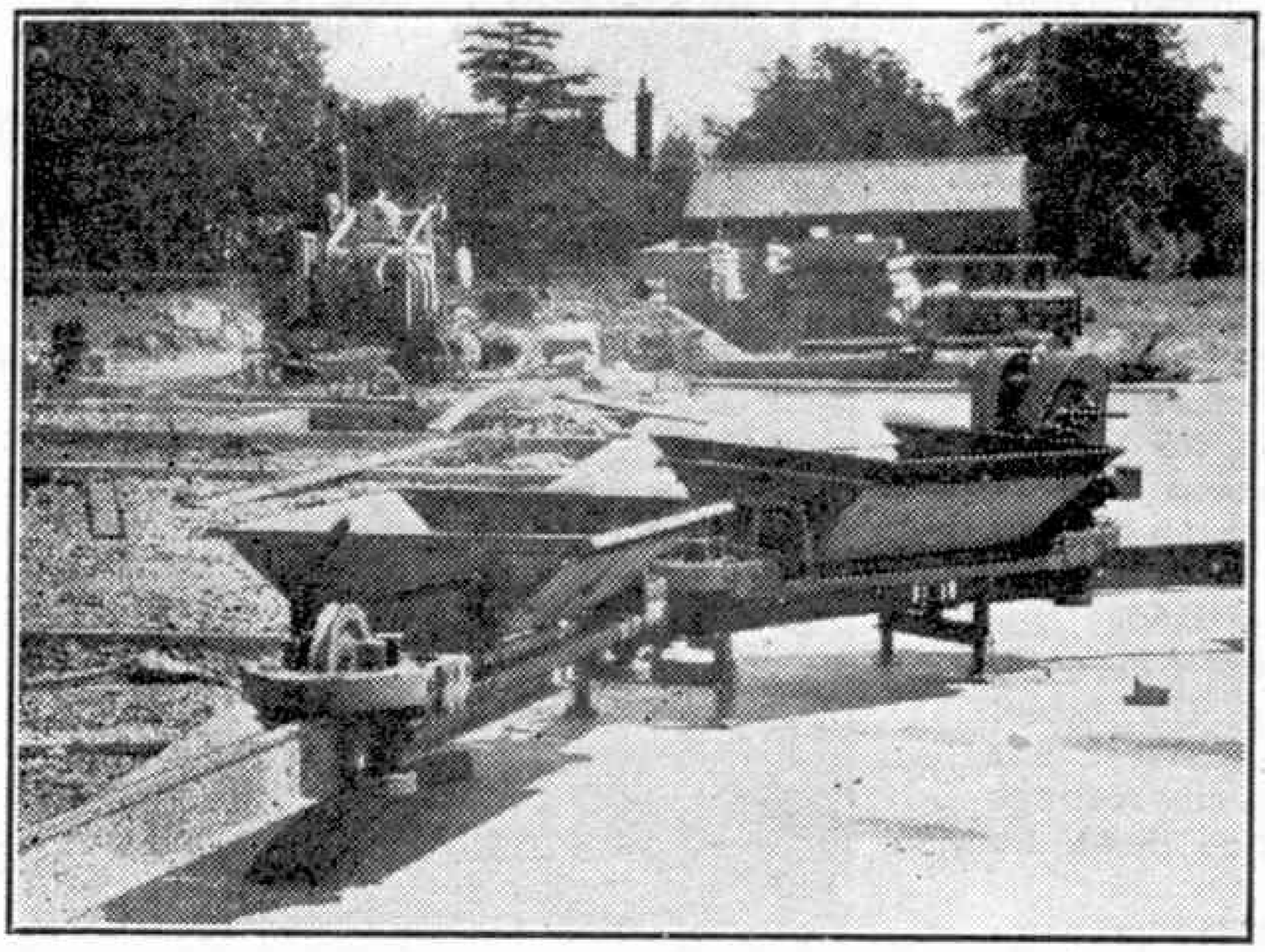


S.S. "Belnor" lists to starboard as her "Jumbo" derrick slings an engine inboard from the "Z" Craft.

Next day loading was continued, the locomotives and tenders being stowed on deck, until by lunch time twenty engines with their tenders had been transferred from the quay to the ship. All that remained to be done now was the lashing down of engines on deck, and by late evening all work was completed. Next morning the *"Belnor"* raised anchor, and slowly set out from Port Said, bound with her cargo of war veterans for the U.K.

A Mono-Rail Transporter

MOVING bricks, concrete and other materials about a site on which building or public works operations are in progress can absorb much time and labour when barrows are used. Various ways of speeding up have been introduced and one of the most interesting of these is the mono-rail transporter shown in the accompanying illustration. This is the product of Road Machines (Drayton) Ltd., West Drayton. The rail is simple but sturdy. It is supplied in standard 15 ft. lengths, and also in special lengths to order, and curves 6 ft. in length and of 12 ft. radius and simple points also are provided. The track is carried on steel stands with adjustable feet. The rails can easily be handled by two men. They are assembled in spigot and socket mountings, without the use of fishplates, bolts or nuts, and extension or shortening of the track to suit the work in hand can be carried out quickly and easily. Footplates for use on soft ground can be supplied.



The mono-rail transporter in operation. Photograph by courtesy of Road Machines (Drayton) Ltd.

Wagons for running on the rail have bodies and running wheels of aluminium alloy, and there are side or steady wheels fitted with springs on each side of the running wheels in order to keep the wagons on the track. The wagons shown in the illustration have side-tipping bodies of 13 cu. ft. capacity, but other types of body can be supplied to order.

For driving the wagons a 3 h.p. air-cooled industrial engine is used. The power unit and gear-box can be fitted to any wagon, and wagons can be made to stop automatically at any point along the track. There are three holes in each rail section where the automatic stop can be fitted.

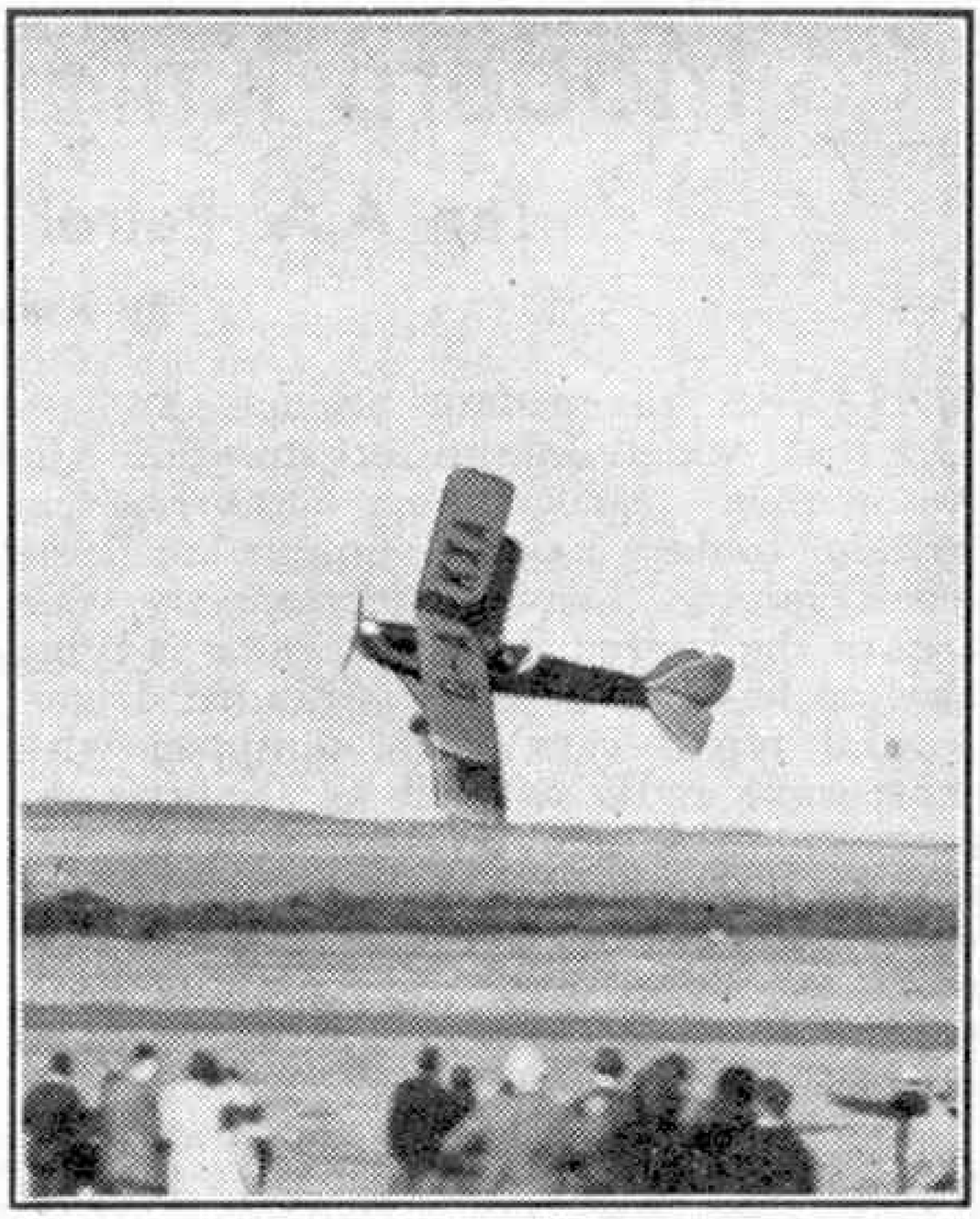
Photographing Aircraft

By Charles E. Jackson

LAST year was the most outstanding for air displays and aviation meetings since the days of the R.A.F. Display at Hendon and of itinerant air circuses. This year promises to be even better, as the R.A.F. Display will be held again, for the first time since the war, and the National Air Races will be spread over several provincial centres instead of being held at one airport as last year.

Numerous other air pageants are already being planned all over the country, and every "*M.M.*" reader should be able to visit at least one air meeting. There is no better souvenir of such a visit than a collection of one's own photographs, and these can be taken with the simplest of cameras by remembering a few straightforward hints.

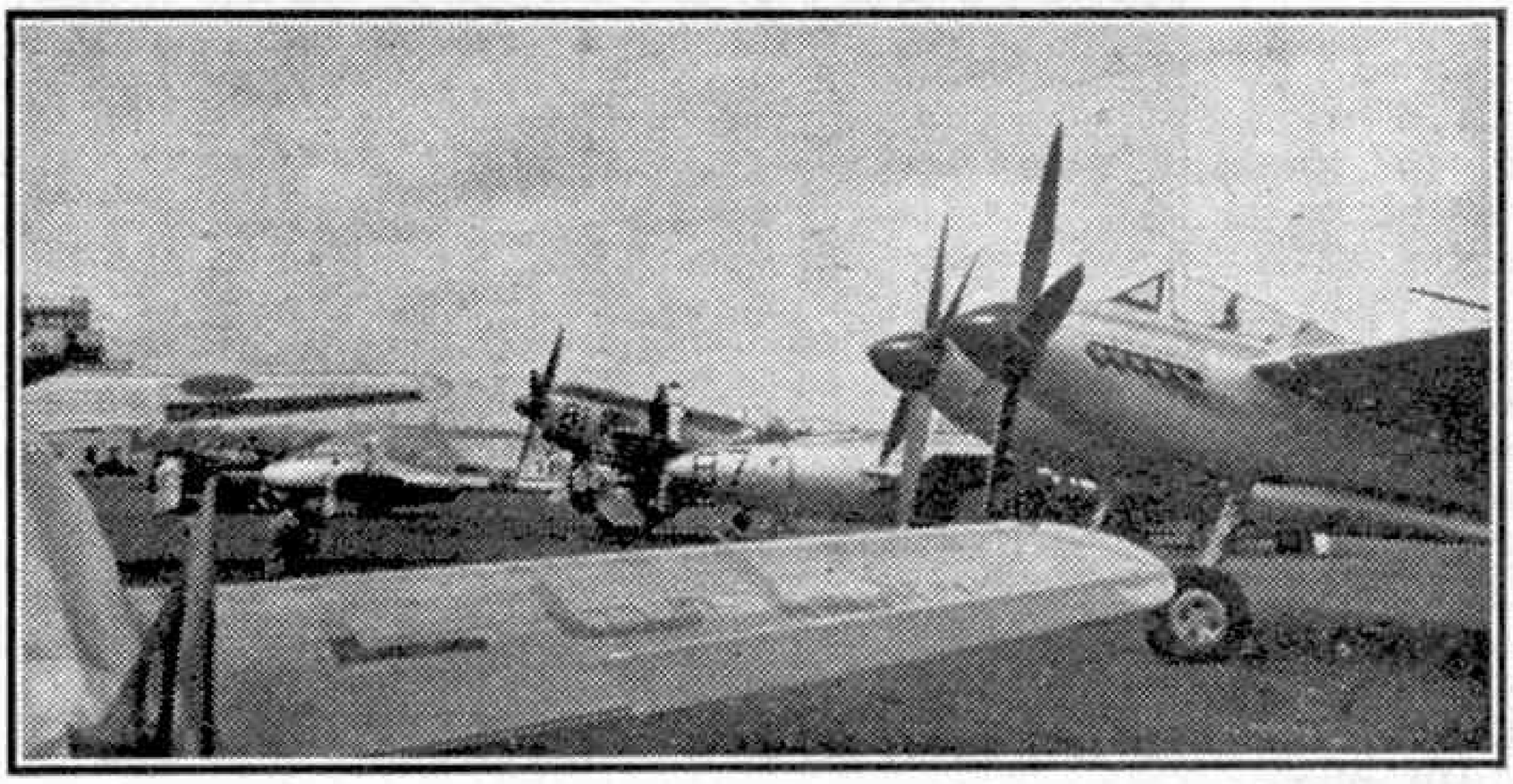
Photographs of aircraft in flight can quite easily be taken by the method of moving the camera to follow the direction of flight. This is particularly easy in air races, where the movements of the machines can be predicted according to the course and turns, and I did not encounter any difficulty with the jet aircraft in last year's races, using shutter speeds quite within the ordinary range. If your camera has no means of reducing the aperture through which light reaches the film do not use a particularly fast film, as there is plenty of light, and over-exposed pictures of aircraft against the sky can be very flat and uninteresting.



Low flying by a D.H. "Tiger Moth."

When photographing the machines on the ground a little extra thought in arranging your viewpoint will be well rewarded. With small sporting aircraft a three-quarter front or rear view will give a good picture, but with larger aircraft I usually find it better to choose a view of some characteristic portion, with one or two human figures to give proportion, rather than to go a long way away from the machine to get it all in without distortion

Finally, don't overlook the colour of the subjects you choose, it is the reflected light from the subject that makes the photograph, and the amount of light reflected by different aircraft varies enormously. For instance, a dull-black Avro 'Lincoln' will need more care than its Coastal Command relatives in their grey and white. Unless the weather is very dull I prefer a slow or medium speed panchromatic film for pictures which best revive one's memories of the thrills of a flying meeting.



Power on parade. High-speed contestants at the National Air Races last year.

Modern Knights of the Road

The A.A. Patrol and Repair Service

By Arthur Nettleton

THANKS to modern science, and to that widely-known organisation the Automobile Association, motorists in Britain to-day have a unique roadside repair service. Over an increasingly wide area of the United Kingdom, radio is being used to bring help to the stranded driver. Several repair cars, each equipped with short-wave radio as well as facilities for remedying various defects in cars, are already patrolling each night within 12 miles of London's Leicester Square. Meanwhile, a night staff at Fanum House, headquarters of the A.A., maintain radio contact with these vehicles.

The scheme operates for those who find themselves in trouble in the London postal area. All they have to do is to telephone the A.A. emergency service and give their name, membership number, and other relevant details. In a matter of minutes an A.A. "Land Rover" with a team of specially trained mechanics, instructed by wireless from Fanum House, is on the spot.

The equipment carried is designed to cope with a wide variety of faults, and the aim is to get the motorist on his way again as soon as possible. The Land-Rovers carry two jacks, a garage creeper, a combination wheel-brace spider, a tow line, a booster battery for starting cars with flat batteries, a floodlamp, a mechanical tyre pump, and a full kit of tools.

The service has proved its worth so admirably that, although it was begun in London as recently as February 1949, plans for its extension to the whole of the country are envisaged. The first step in this expansion has been to provide the Birmingham area with a fleet of radio-controlled breakdown vehicles, and Manchester, Leeds, Glasgow and Edinburgh are the next centres on the list of places provisionally earmarked for the introduction of the scheme.

The nerve centre of the service in London has a 60-ft. radio mast on its roof, and the radio telephone messages go by Very High Frequency equipment. The twelve-mile radius over which the scheme operates at present is the limit of the short-wave transmitter at the moment, but the range may ultimately be increased considerably.

About 400 motorists stranded at night-time are now being assisted each month as a result of the scheme. Its value lies not only in the speed with which it is able to operate, but also in the fact that it gives help just at the times when most commercial repair services are closed down.

Electrical trouble has been found the most frequent cause of breakdown, with tyre trouble second and lack of fuel third. But the service is an emergency one in the fullest sense, and already some curious difficulties have been encountered and successfully overcome. One driver lost his ignition key down a drain and summoned the A.A. repair patrol to get him out of his quandary. Others have telephoned for assistance when fog-bound, when they have inadvertently poured water instead of petrol into the tank, and when they could not get back into their parked cars because the door locks had jammed.

One of the Land-Rovers of the A.A. radio-controlled night breakdown service sets off to give aid to a stranded motorist.

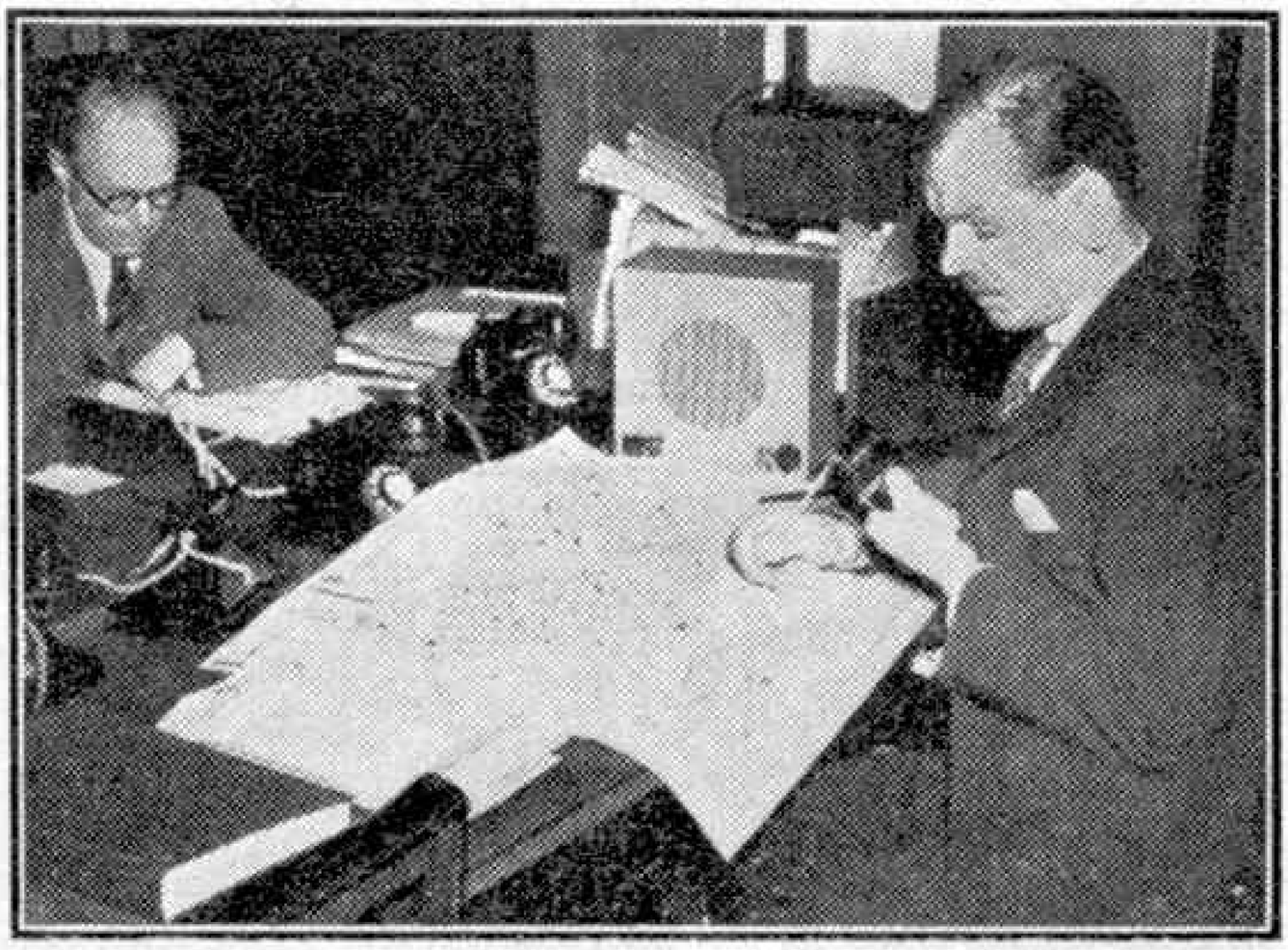
Large-scale maps in the radio control room at Fanum House enable the position of a stranded motorist to be located quickly. Armed with this information it takes only a few moments to radio instructions to the A.A. patrol vehicle nearest the spot, and the team make for the locality of the breakdown at once.

They are seldom beaten by a mechanical or electrical fault in a car. If the Land-Rover does not carry the necessary spare parts to remedy the defect, efforts are made to improvise them. When one driver was in difficulties, the A.A. experts used wood and iron found on a nearby bomb site to get him going again.

Such ingenuity and eagerness to help the stranded driver is hardly surprising, for the Automobile Association has been helping motorists for nearly half a century. Although the radio get-you-going service is quite a recent idea, the A.A. has been operating for 45 years.

It all began in a humble way in the pioneer days of the internal combustion engine, and the first of the road patrols was recruited in 1905. He had no uniform, but wore an A.A. armband and had a disc hanging from his coat. Instead of riding a motorcycle combination, as the present-day patrols do, he pedalled along on a bicycle. The purpose of the disc was to warn drivers when the police were operating a speed-trap in the vicinity, for it could be reversed to show red at these times.

Nowadays it is difficult to realise that in 1905 a general speed-limit of 20 m.p.h. was enforced on motor vehicles in Britain, and that "offenders" caught by the police were often fined £5 or more for only slightly exceeding this pace.



Night staff at Fanum House headquarters of the A.A. receives emergency messages from motorists by telephone and radios instructions to patrol cars on the road.

The "Attentive Aunt," as the A.A. has been aptly called, was founded primarily to fight this anti-motoring movement, and eighteen months later the Association had 40 permanent patrolmen on its pay roll, who were augmented by about 60 more at weekends. They concentrated chiefly on the roads from London to the South Coast, but by 1908 the patrol system had extended as far afield as Scotland.

Nowadays the khaki tunics, breeches, and black leggings of these guardians are well-known, but this uniform was not introduced until the A.A. had been functioning for more than five years. The equally familiar roadside telephone boxes from which members may telephone the nearest A.A. office appeared in 1910.

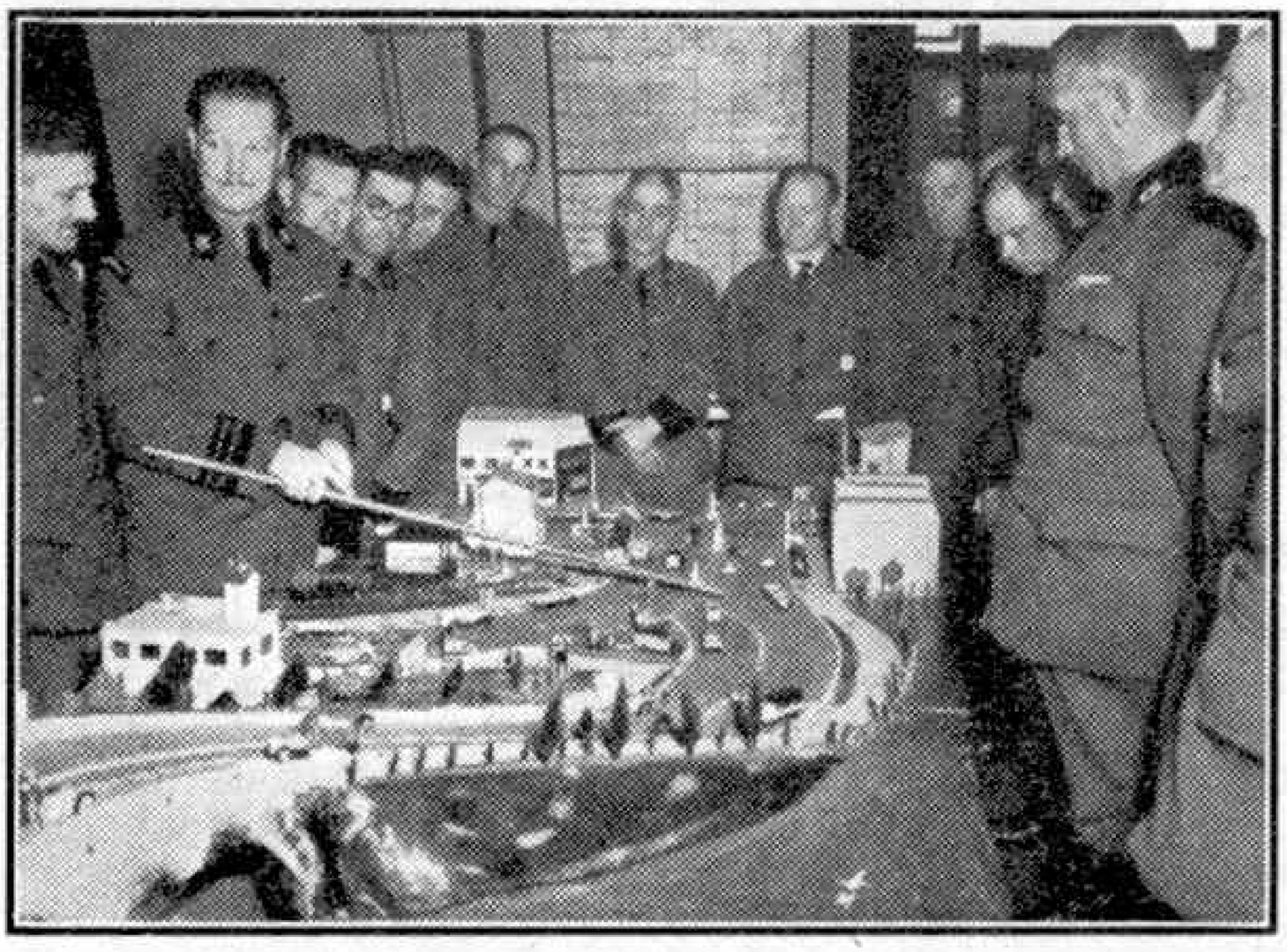
Throughout its 45 years of life, this great organisation, which has been copied but is still unequalled, has continually tried to keep well abreast of motorists' needs, by providing new services to meet the latest conditions or to supply facilities hitherto overlooked.

A road scout to the rescue. The A.A. patrolmen are trained to cope with almost any emergency a motorist may encounter.

From the conspicuous telephone kiosks information can be obtained about road conditions ahead, or how to get to an obscure destination. A.A. offices also supply route cards in response to postal enquiries by members, smooth out the complications of foreign touring, and help overseas motorists who come to Britain.

The control of road traffic is an important duty of the patrolmen, and their experience of parking problems on a large scale is often used when big events are being planned.

In addition, as the technical aspects of motor vehicles have become more complex, the patrolmen have had to increase their mechanical knowledge to keep pace with developments. The road patrol service is still the principal benefit provided to members of the A.A., and the first duty of these road scouts is to render mechanical assistance to any member whose car or motorcycle has broken down on the road.



The Chief Inspector sets a problem to A.A. patrolmen at the Camden Town school of instruction. The model shows part of the Kingston By-pass.

One recent innovation, in addition to the radio-controlled breakdown service, is a school of instruction at Camden Town, London, where A.A. road scouts undergo a ten-day course of training in the mechanics of motor and motorcycle maintenance.

One full day is occupied with explanations of the workings of lights, ignition and self-starters, since experience has shown that electrical failures account for 90 per cent. of the roadside troubles of motorists to-day. Another practical side of the course is refitting tyres at high speed, and there are lessons in makeshift ways of executing temporary repairs to car engines and accessories. In the fitting of new tyres it has been found that by "knowing how" a patrolman can accomplish the job in less than 60 seconds!

One of the most interesting features of the school is a detailed scale model of part of the Kingston Bypass Road, complete with accurately proportioned model cars, buses, and other traffic. It is used for instruction in the finer points of driving technique and other matters bearing on road safety, knowledge that is of great importance to the A.A. patrols in directing traffic on real roads. Such duties call for quick decisions, and with the help of the model the instructors at the school are able to reproduce actual traffic conditions in miniature, and to demonstrate how the patrolman on traffic control should handle the situations which may confront him.

The aim of this school is not to make the men engineers, but rather to help them to be masters of mechanical first-aid. The course terminates with an examination, and a high standard is insisted upon in all subjects. Every patrolman who completes the syllabus returns to his beat knowing that he can handle any situation he is likely to encounter.

Talking of beats, the A.A. road scout usually has to patrol about 15 miles, and since the end of the war all the motorcycle outfits have been replaced with new ones. Each year about 2,000,000 "incidents" are recorded in the reports of these Good Samaritans of the Road—help in the case of mechanical breakdowns and information on a variety of subjects.

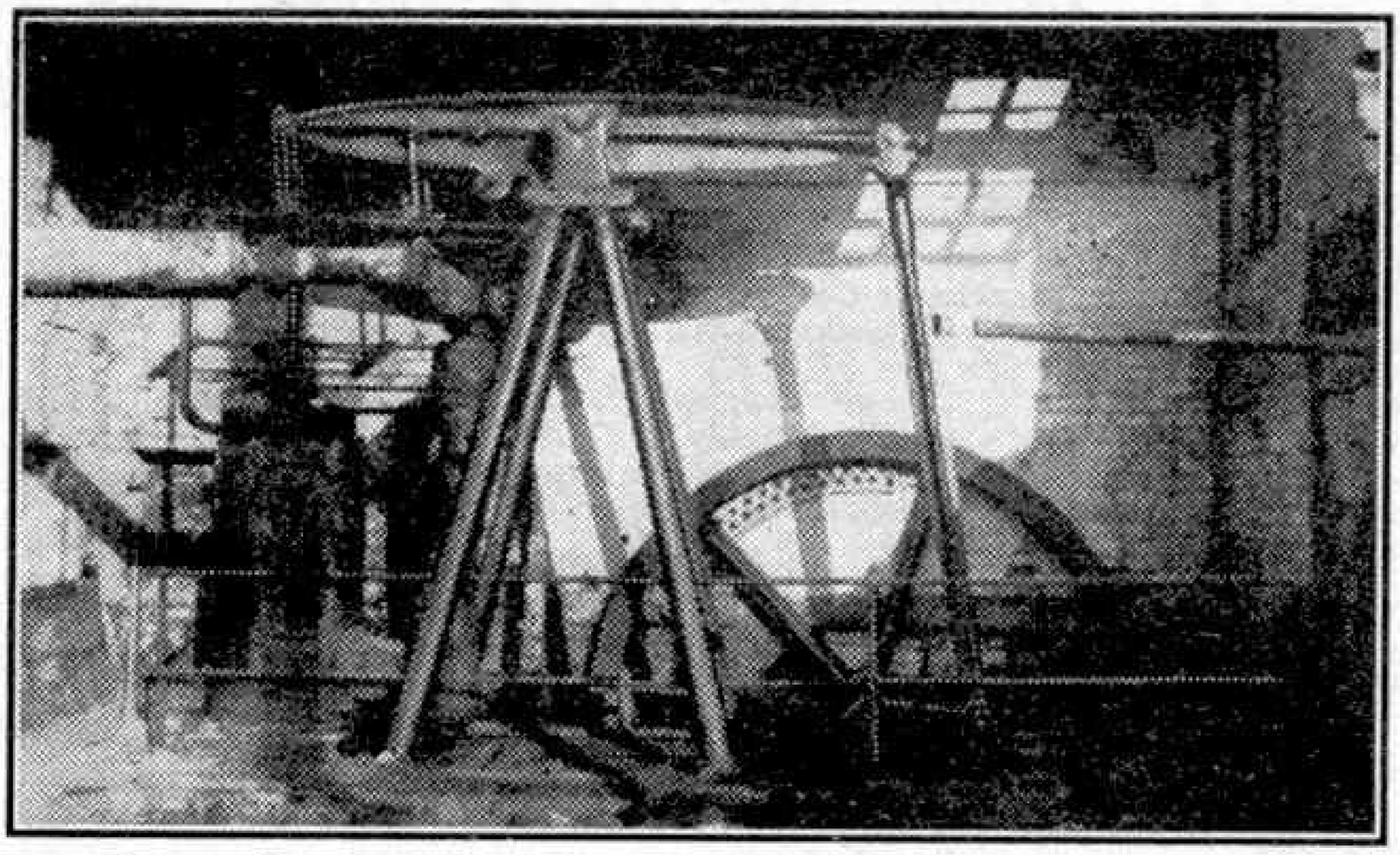
Unusual tasks sometimes enliven the road scout's day. Patrolmen have helped to apprehend criminals, and have even saved train passengers from danger. An incident in the latter category occurred when an A.A. scout discovered that heavy masonry had been dislodged from a railway bridge by a passing lorry and that the line was obstructed. Thanks to his timely warning, a Glasgow-London express train was saved from almost certain disaster.

Signposting the routes to important venues, indicating detours when roads are impassable as a (*Continued on page 286*)

Beam Engines' Long Service

By W. R. Watson

THE beam engine was one of the earliest types of steam engine to be designed. In years gone by several of these engines were employed for various purposes at collieries, but the last one was replaced in 1934. The picture on this page shows one of the last to be taken out of service. Its single cylinder is of cast iron, 20 in. in diameter, the piston having a stroke of 5 ft. Compare the swept volume of 18,850 cu. in. of this cylinder with that of a Rolls-Royce "Griffon" II aero engine, which is 186.8 cu. in. The latter gives approximately twice the power, although only one hundredth the size of the beam engine.



One of the last beam engines to be taken out of colliery service in South West Lancashire. Its single cast iron cylinder had a diameter of 20 in.

The reason for the great size of the cylinder is apparent when it is remembered that neither boilers nor cylinders had been made to withstand high pressures in the days when beam engines were made. The steam enters on the lower side of the piston at a pressure of 25 lb. per sq. in. and raises it. It is then condensed, in a separate condenser, and the piston falls by its own weight owing to the partial vacuum thus produced below it. The complete cycle is then repeated. The engine normally works at 35 cycles per minute, and the reciprocating motion of the piston is converted into rotary motion by the pivoted cast iron beam and the wrought iron crank.

A large cast iron spur wheel keyed on to the crankshaft has 192 teeth of 3 in. pitch, giving a pitch circle diameter of 15 ft. 3 in. The pinion is a mortice wheel of 25 teeth, made from hornbeam to eliminate noise, giving a reduction ratio of 7.68 to 1.

Another beam engine built in 1832 was installed on the platform of Edge Hill railway station, Liverpool. It will be remembered that the line between Manchester and Liverpool was opened in 1830. The locomotives of the day were not powerful enough to haul the trains from Lime Street Station, when this was opened in 1836, up through the inclined tunnel to Edge Hill, so this beam engine was installed to assist, hauling them by means of an endless hempen rope. In later years locomotives had increased in size and power and they were then capable of taking trains through the tunnel unaided.

When its services were no longer required, this engine was sold to Richard Evans and Co. Ltd., colliery proprietors, who installed it at their works at Haydock, Lancashire, in 1860. There it was used to drive saws and other woodworking machinery in the wagon building shop, and it continued to perform this task until 1943. Then the power supplied by the old engine became insufficient to meet the demands made upon it by the modern machinery that had been installed, and it was therefore decided to use electric motor drives for these machines. The engine went into a well-earned and honourable retirement after 111 years of service, but it is still in full working order and is run for a short while daily. Upon the nationalisation of coal mines it passed into the final stage of its history, under the National Coal Board, N.W. Division, No. 3, St. Helens Area.

While these beam engines seem clumsy compared with the engines of to-day, it must be remembered that they were the result of early pioneer work in steam engineering.

Air News

By John W. R. Taylor

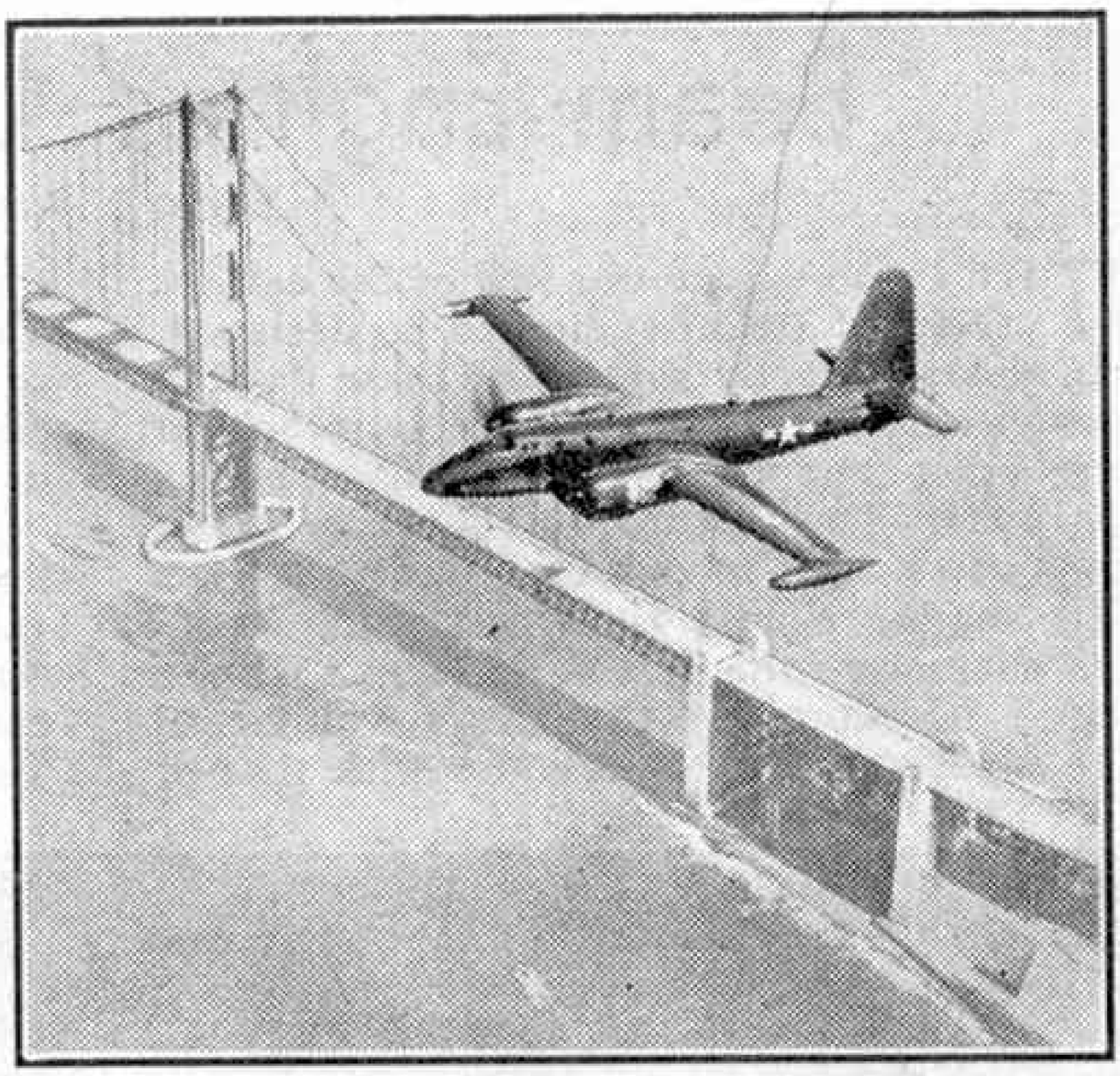
Another "Sub-Killer"

During the debate on the 1950 Statement of Defence in the House of Commons, Mr. Winston Churchill read extracts from a U.S. Navy announcement giving details of the new Lockheed P2V-4 "Neptune" anti-submarine bomber. He added: "I have not read anything so encouraging or hopeful for many a long day . . . . . If this should come true, the menace of modern U-boats may be finally overcome."

The P2V-4, illustrated here, is specially equipped to seek out and destroy the dangerous "Schnorkel" submarine, which can remain submerged indefinitely with only a small "breathing" tube projecting above the surface. In addition to ultra-sensitive long-range radar, the machine carries radio sono-buoys, which can be dropped by parachute in a specific pattern over an area where a submarine is suspected. Floating on the surface, each buoy lowers a small hydrophone to a depth where it can pick up the noise of the submarine's propellers and transmit it by radio to the aircraft overhead. The relative noise level of signals from the various buoys tells the radar operator where the submarine is, enabling him to keep track of its movements.

The P2V-4 can carry sufficient armament to destroy any submarine it locates, including torpedoes, rockets, bombs, mines, machine-guns and 20 mm. cannon. Alternatively, it could keep the submarine submerged until surface vessels arrived to finish it off.

Although as big as "Fortress" bombers of World War II, P2Vs have already made more than one hundred carrier deck take-offs. A hint of their range possibilities was given when the famous "Neptune" aircraft "*Truculent Turtle*" set up the present World Long-Distance Record of 11,236 miles in 1946.



P2V - 4 "Neptune" anti - submarine bomber over San Francisco's Golden Gate Bridge. Photograph by courtesy of Lockheed Aircraft Corporation, U.S.A.

New Channel Islands Service

B.E.A. have started a return air service between Birmingham and the Channel Islands, capable of flying 252 holiday-makers in each direction every week. One return flight is scheduled daily from Monday to Friday and two each on Saturdays and Sundays. Extra flights will be added at peak holiday periods if the demand justifies it.

The new service is operated by comfortably-equipped 28-seat "Dakota" air liners. Fares from Birmingham to either Jersey or Guernsey are £6 15s. 0d. single or £11 10s. 0d. monthly return, which includes a luggage allowance of 33 lb. per person.

Introducing the "Skyjeep"

A versatile British all-metal light 'plane able to carry four adults and two children has been developed by the Chrislea Aircraft Company from its well-known "Super Ace." Known as the "Skyjeep," it has been designed specially for the export market, and its comparatively low price of £2,250 has already attracted orders from as far afield as Uruguay and Brazil.

The lower illustration on this page shows the "Skyjeep" to be similar in appearance to the "Super Ace," but it has a tailwheel undercarriage. A 155 h.p. "Cirrus Major" engine gives it a cruising speed of 118 m.p.h. over a range of 530 miles. The machine normally carries a pilot and three passengers, but the luggage compartment, which accommodates up to 100 lb. of baggage, can be adapted to form two "occasional" seats for young children. Furthermore, the "Skyjeep" can be used as an ambulance or cargo-'plane, the entire top portion of its rear fuselage hinging up to permit easy loading of a stretcher or light freight.

Chrislea "Skyjeep," showing how the top part of the rear fuselage can be aised to permit easy loading of a stretcher or light freight. Photograph by courtesy of Chrislea Aircraf! Co. Ltd.

Of particular value to the private owner is the "Skyjeep's" ability to operate from small fields, its take-off and landing runs being only 130 and 100 yds. respectively in a 10 m.p.h. wind. If required, it can be fitted with Goodyear cross-wind landing gear, as described in the August 1949 "*M.M.*"

Helicopter Ambulances for Malaya

Three Westland-Sikorsky S-51 ambulance helicopters have arrived in Malaya to equip the R.A.F. Casualty

One of the first pictures showing use of the unique parachute braking technique on the new Martin XB-51 3-jet bomber. Photograph by courtesy of The Glenn L. Martin Co., U.S.A.

Air Evacuation Flight. They will be used to pick up jungle patrol casualties of the British security forces operating against Communist bandits, and each machine is equipped to carry two stretchers in external "nacelles" on each side of its fuselage.

The new flying ambulance service will greatly reduce time taken to get wounded men to hospital, as previously they have had to be carried back along rough jungle tracks. The helicopters will operate normally from advanced landing strips, but in some cases may be able to alight in jungle clearings close to a patrol. Experiments will also be made to see if it is possible to lift casualties into a helicopter while it is hovering, by means of the power winch which is fitted to most machines of this type.

Jet Bomber has "Parabrake"

A revolutionary feature of the new Martin XB-51 three-jet attack bomber is its tail parachute-brake, shown in use in the upper photograph on this page. The parachute, which is of the highly efficient ribbon type, developed by the German *Luftwaffe*, can best be regarded as the jet equivalent of a piston-engined 'plane's reversible-pitch propeller. It reduces the aircraft's landing speed, and thus enables it to operate into comparatively small airfields. The parachute-brake is not generally required when the XB-51 operates from normal-sized runways, and when not in use it is stowed in a compartment at the base of the fin.

Experiment in Paint

The top surface of the fuselage of one of B.O.A.C.'s 40-passenger Canadair Four ("Argonaut" class) air liners has been painted white to test the effect of the low heat absorption qualities of this colour paint on passenger comfort. B.O.A.C. hope that it will result in a reduction of 12 to 15 deg. in cabin temperatures while the aircraft is on the ground at tropical airports.

The aircraft on which the experiment is being made is operating on a normal service schedule. If the test is successful, the top surfaces of all B.O.A.C.'s fleet of 22 "Argonauts" will be painted white.

Spurious Spinner

A nose radar installation resembling a propeller spinner makes the U.S.A.F.'s new North American F-95A look more like a piston-engined fighter than a jet. But its speed of around 700 m.p.h. leaves little doubt of the tremendous power hidden inside its sleek fuselage.

The F-95A, illustrated on this page, is a development of the well-known F-86A "Sabre," holder of the World's Absolute Speed Record, and has been designed specifically to intercept and destroy attacking aircraft at high altitudes. It is powered by a General Electric J-47 jet engine, complete with an afterburner which gives increased thrust for short periods by burning additional fuel in the engine exhaust gases.

Auster "Flying Surgery"

The Auster Aircraft Company have designed a new ambulance and "flying surgery" aircraft for Australia's "flying doctor" service. It will be able to carry standard full-size stretchers and a seated attendant as well as the pilot. First-aid equipment will be carried and provision made for blood transfusions during flight.

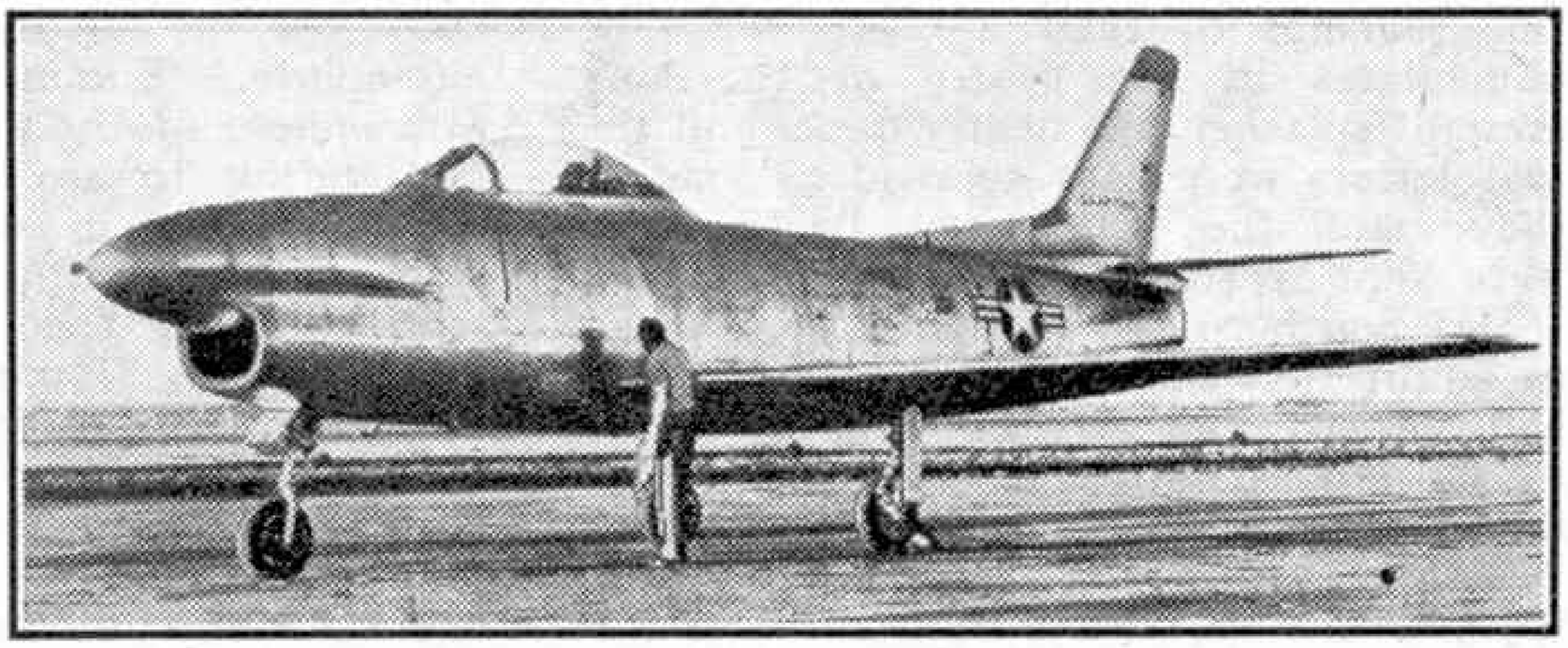
As both New Zealand and South Africa are known to be interested in starting flying doctor services based on the Australian pattern, it is quite possible that the new Auster may become standard equipment in all three countries.

Giant Hangar Named After Australian Pioneer

A new hangar being built at Schiphol Airport in Holland is to be named after the late Sir Charles Kingsford Smith, the famous Australian pioneer pilot. It will be one of the largest in Europe, 180 yds. long, 43 yds. wide and 40 ft. high, with two doors each 82 yds. long. Two canteens accommodating 500 people will be contained in the wings

"Jetliner's" Record

The Avro Canada "Jetliner" has flown the 252 miles from Toronto to Ottawa in 36 min. 5 sec., at an average speed of 418 m.p.h. The present scheduled air liner service between these towns takes 1 hr. 40 min.



U.S.A.F. latest type jet fighter, the North American F-95A, with nose radar installation. Photograph by courtesy of Official Department of Defence, U.S.A.

Engines of Title

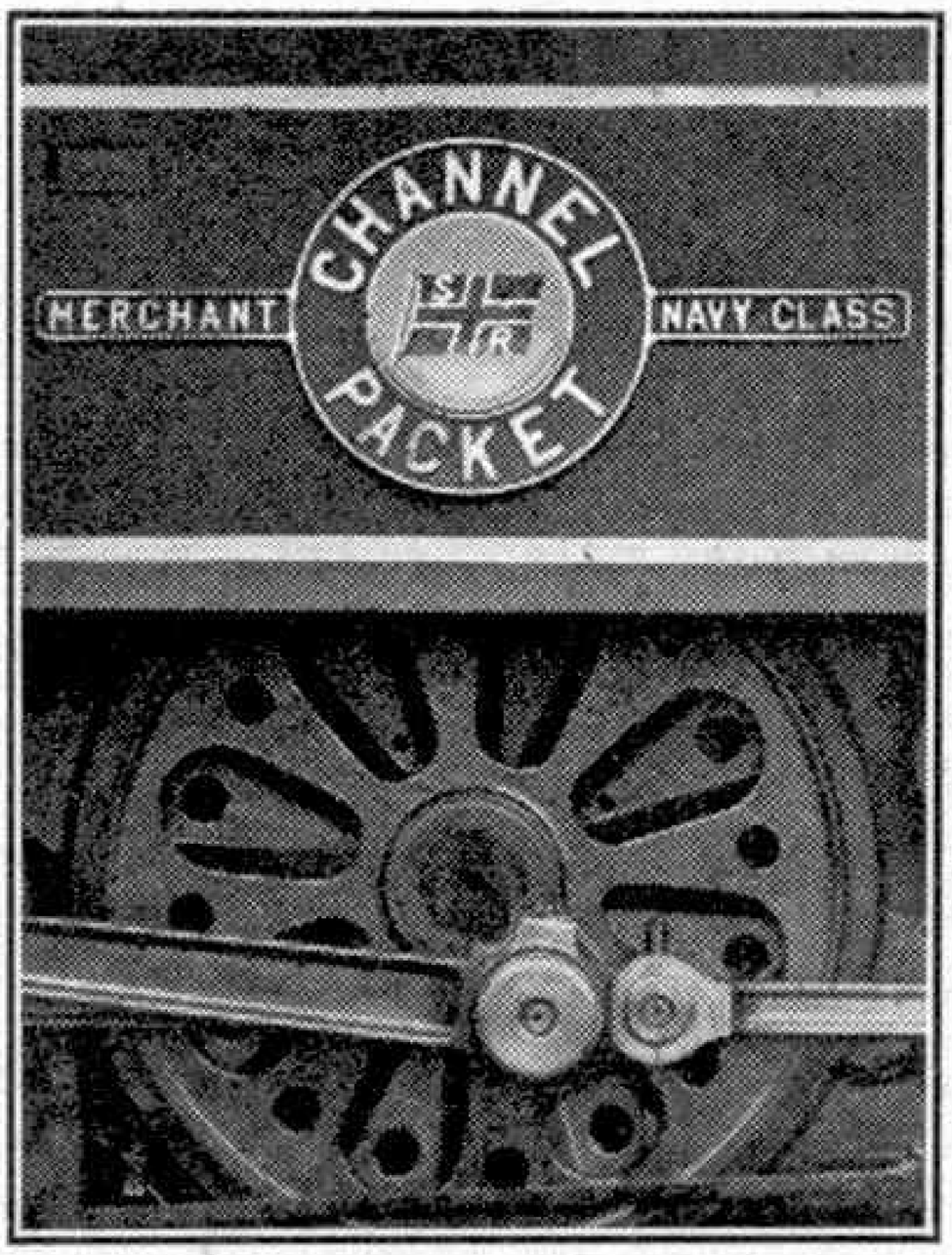
By G. Lack

TO me, the habit of engine-naming—so peculiarly British—has long provided fascination. First, as a schoolboy, it gave the interest of "collecting"; later, it developed into a broader interest in each company's character and outlook.

I judge myself fortunate to have begun my schoolboy enthusiasms in the later 1920s, when the railways were already in four groups but still retained something of the individualistic atmosphere of the old companies. I first became an enthusiast when living near the main line of the former London and South Western Railway, and it was always a source of keen regret to me that my beloved "South Western" could not lay claim to a single named express engine. I had actually gone to live in Great Western territory before Mr. Maunsell produced his "King Arthurs" for the Southern, of which the L.S.W.R. now formed part, and how proud I was to cycle over with my friends—all "G.W." enthusiasts, naturally—and show them these graceful engines speeding through Surbiton. Their names were so appropriately noble too, such as *"Sir Galahad," "Sir Blamor de Ganis"* and the rest. The placings of their nameplates in the centre of the long straight splasher was neatly done; and the cast letters were easy to read as long as they, and the smart red background, were kept reasonably clean

But Southern fan though I was, I had to admit that the Great Western Railway had carried the British naming policy to its highest pitch of efficiency. This railways' series system—"Saints," "Stars," "Castles" and so on—were so tidy and typical of "G.W." outlook. Heretical though it may seem, however, I always felt that the names of the more modern types, such as "Castles" and later "Halls" were a little dull. With the attractive, almost perky outside-framed 4–4–0s it was another story. I well remember my thrill at the first sight of such veterans as *"Sir Watkin Wynn"* (now no more). Even rarer were the "Dukes," those graceful, straight-boilered 4–4–0s that by then appeared to lurk mainly in the remote parts of the Great Western system.

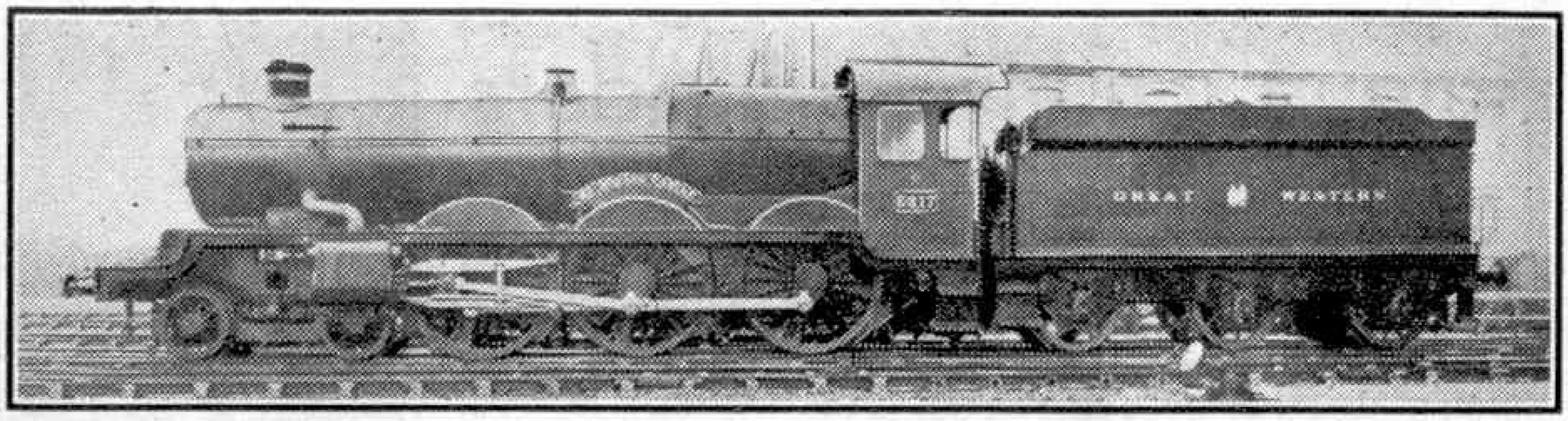
Their nameplates and those of the 4–6–0s, curved to follow the rounded splasher of the coupled wheel, seemed much more graceful than those of some of the "Bulldog" and kindred classes; these were sometimes combined with the number on the cab sides in a manner not easy to read. But in the main G.W.R. names were models of legibility, with each polished letter set on a black background and handsomely finished off by the curved brass border.



The distinctive nameplate of S.R. "Channel Packet," the first engine of the "Merchant Navy" class. The illustrations to this article are British Railways Official Photographs.

The former London and North Western section of the L.M.S. was also within easy cycling distance; and here it was interesting to see a totally different naming policy in operation. The beloved "chocolate and white" coaches were still much in evidence, as was the neat but small Crewe nameplate. Coming from the logical atmosphere of the G.W.R. it was almost bewildering to see the apparently haphazard choice of titles for all classes, from the graceful "Claughtons"—then still kings of the Euston line—to the plucky little "Jumbos." These latter engines vied in our boyish favour with the G.W.R. "Dukes," no doubt partly because both were then rare birds of passage.

In one thing, at least, the L.N.W.R. could claim consistency. The type and mounting of the nameplate had followed the same style for many years. The plate



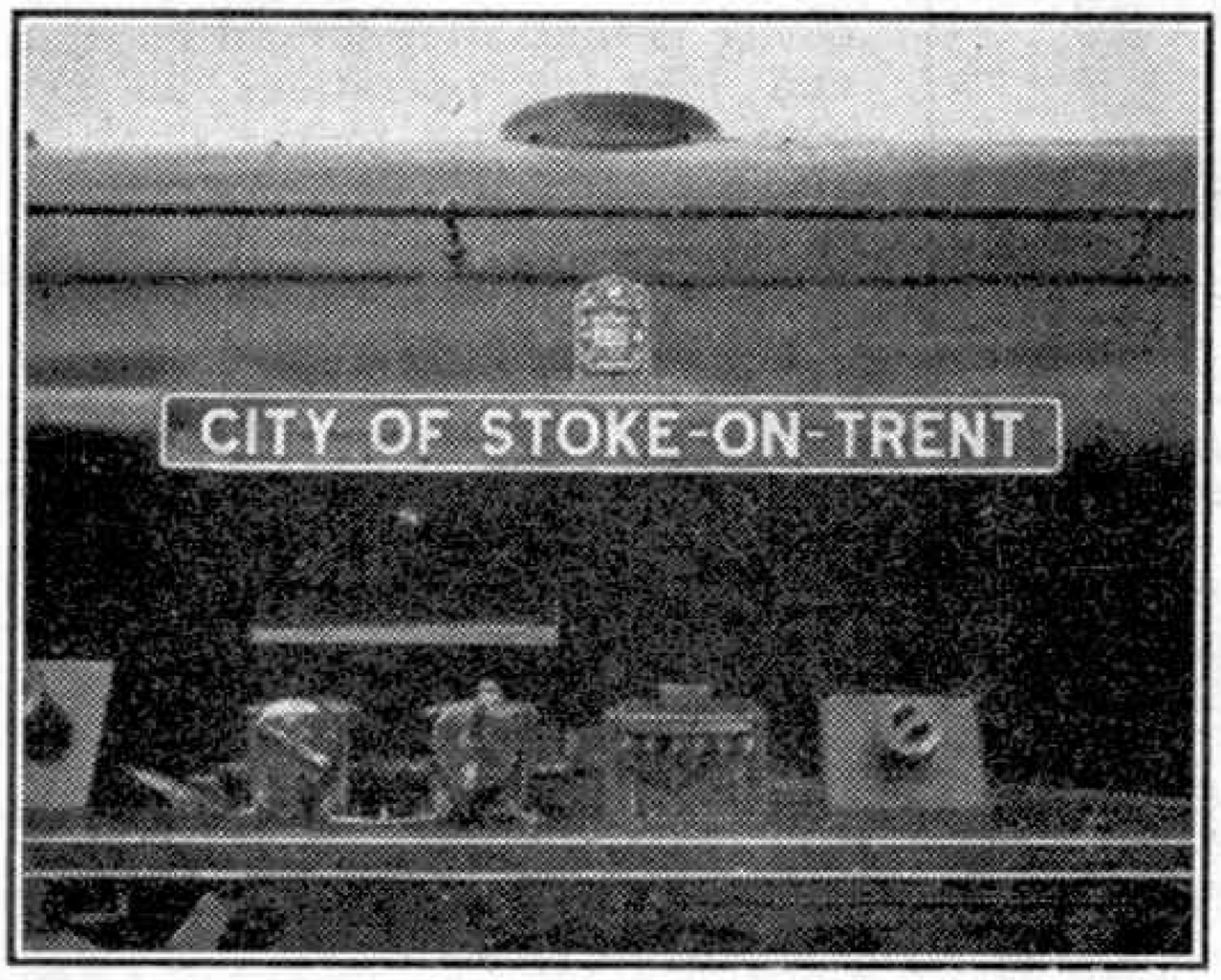
The typical Swindon style of nameplate and mounting are shown in this illustration of No. 5017 "St. Donats Castle." The nameplate and cab numberplate match one another in having brass characters and edging with a black background.

was small and not too easy to read, particularly when it was passing at speed; but many of the names had a romantic ring which was sometimes lacking in the more carefully-chosen titles of other railways. *"Percy Bysshe Shelley," "Bucephalus"* and *"Faerie Queen"* were three examples that, for some reason, long stuck in my memory.

The Midland section of the L.M.S. was also on my visiting list. It scorned the named engine, which again seemed typical of a line whose locomotives seemed to be so undeviatingly efficient; I almost said monotonously so! Although, to be fair to a line singularly lacking in the spectacular, the old Midland did build up the only consistently successful class of compound engines ever seen in this country in any quantity. The Great Northern and Great Eastern sections of the L.N.E.R. also seemed to me lacking in interest with their "anonymous" engines. On the former, apart from the rarely-seen *"Henry Oakley,"* the first British "Atlantic," the only named engines were the then comparatively new Gresley "Pacifics." In those early days they seemed even more striking than now, when 4–6–2s have invaded three out of the four regions of British Railways.

I always thought that the nameplates of these monsters were as pleasing in their way as those of the G.W.R. They were not as large but the style chosen for the lettering was neat and very legible, the plates fitting snugly over the middle splasher. Many of those old titles were a real joy, the adoption of racehorse names being so apt to the speed propensities of the engines and the locale of the old Great Northern main line. Even to-day, the mention of *"Blink Bonny"* or *"Flying Fox"* brings back to me the characteristic *"clank-clonk"* of the rods as these huge yet graceful monsters came off the coal sidings at King's Cross.

One section of the old L.N.E.R. was always a fruitful source of interest to us youngsters; the Great Central. Its express engine stud was not numerous but it made up for it in attractiveness. The G.C. was one of the many lines that sported engines named after royalty —always popular but, so it seemed to me, a very easy way out of the naming problem. Their *"King George V"* and *"Queen Mary"* (I am quoting the names from memory) were older 4–4–0s with large driving wheels and a singularly graceful curved splasher to carry the nameplate; they seldom visited London, seeming to prefer the hills and dales of Derbyshire or their Lincolnshire routes. Catching one of these engines at Neasden sheds, perhaps on a Cup Final day, was then one of the high-spots of name-hunting to the London enthusiasts. I always thought that they and the G C. "Atlantics" were more graceful than later types, many of which had the look (Continued on page 286)



The nameplate of L.M.R. 4-6-2 "City of Stoke-on-Trent" carries a reproduction of the coat of arms of that city.

Among the Model-Builders

By "Spanner"

Michael J. Murchie, Dumfries, one of the successful competitors in the "Yuletide" Model-Building Contest.

Two-Speed Reversing Crane Hoist

When a non-reversing motor is used in a model crane, the lowering of the load and the jib is generally effected by disengaging the hoisting shafts from their respective driving shafts and regulating the amount of cord paid out by means of a brake. Fig. 1 shows an ingenious device that enables the paying out and hauling in of the hoisting cord to be operated by the motor.

The drums 2 and 3 are utilised for this purpose, and are driven by an E020 Electric Motor. The Motor drive is led through Sprockets and Chain to a Rod carrying a ½" Pinion. The Pinion meshes with a 57-teeth Gear 1, the shaft of which also carries a ½" Pinion 5 and the drum 2 built up from a Sleeve Piece and two ¾" Flanged Wheels. The Rod of the drum 3 is slidable in its bearings, and in order to allow sufficient movement of the Rod, the drum carries a ¾" Flanged Wheel at

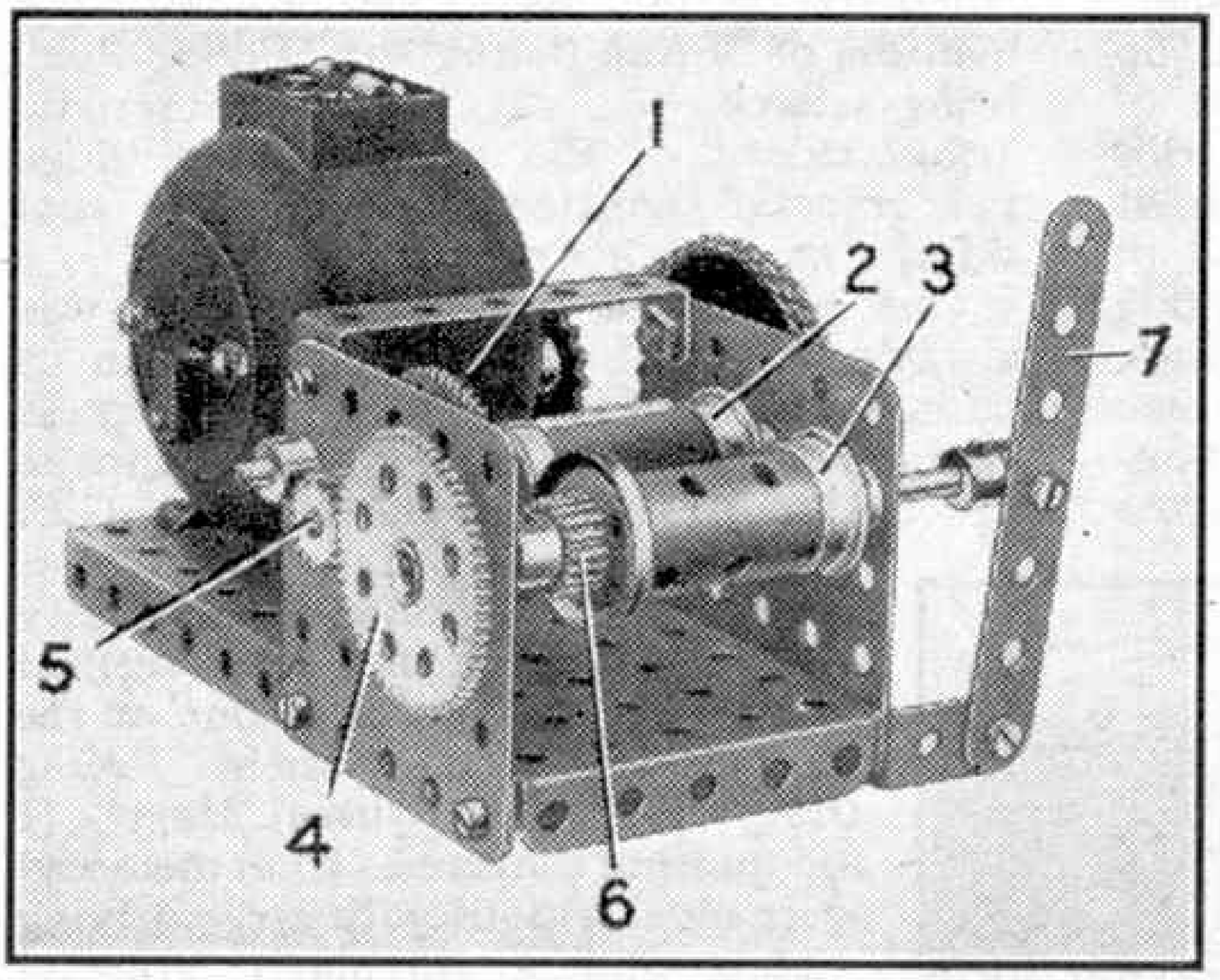


Fig. 1. A novel two-speed reversing device suitable for operating a crane hoisting mechanism from a non-reversing motor.

one end only. The other end of the Sleeve Piece is passed over a Chimney Adaptor, and a 1" loose Pulley is clamped in position by the Pinion 6.

The sliding movement of the Rod is controlled by the lever 7. This is pivoted at its lower end to a 1" × 1" Angle Bracket, and loosely connected to the Rod by a ⅜" Bolt, passed through its centre hole and inserted in the tapped bore of a Collar free on the Rod between two fixed Collars. A nut prevents the shank of the Bolt gripping the Rod.

The hoisting cord is wound round one of the drums and passed over a Pulley at the head of the crane jib, and after passing through a Single Sheave Pulley Block it returns over a second Pulley at the jib head, and is wound on to the remaining drum.

With the lever 7 in the position shown the drive between the two drums passes from the Pinion 5 to the Gear 4, so that the drum 2 rotates three times as fast as the drum 3. The former should be arranged to wind in the hoisting cord and the latter to pay out. As three times the amount of cord paid out is hauled in, the load is raised. When the lever 7 is moved to the left, the Pinion 6 engages the Gear 1, and the Gear 4 is moved out of engagement with the Pinion 5. This causes the drum 3 to pay out the Cord faster than it is hauled in, thus lowering the load.

The chief disadvantage of this device is that after several hoisting and lowering operations all the cord is wound on to the drum 2, and consequently some means must be devised for winding it back to drum 3. To do this without altering the position of the crane hook a 1:1 ratio should be inserted between the two drums. Very little power will then be required to wind the cord back again.

A Reader's Model Locomotive

A streamlined locomotive makes an interesting subject for a Meccano model and one which provides a good test of a boy's skill and ability in using Meccano parts to the best advantage. D. de Wit, Blackburn, built a model of this type and sent a photograph of it to me some time ago. I am reproducing the photograph

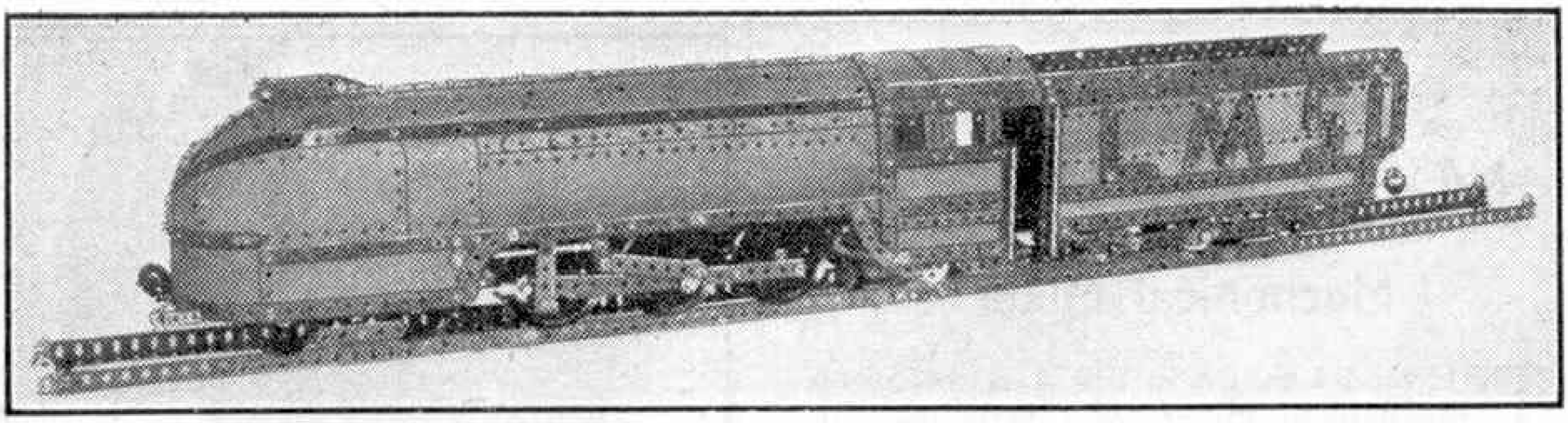


Fig. 2. A realistic model of a streamlined locomotive. It was built by D. de Wit, Blackburn.

on this page, as I think the model is quite a good effort in view of the parts available to its builder. The model is 3 ft. 3½ in. long and the streamlined housing is quite neatly reproduced without too much bending or distortion of Plates, etc.

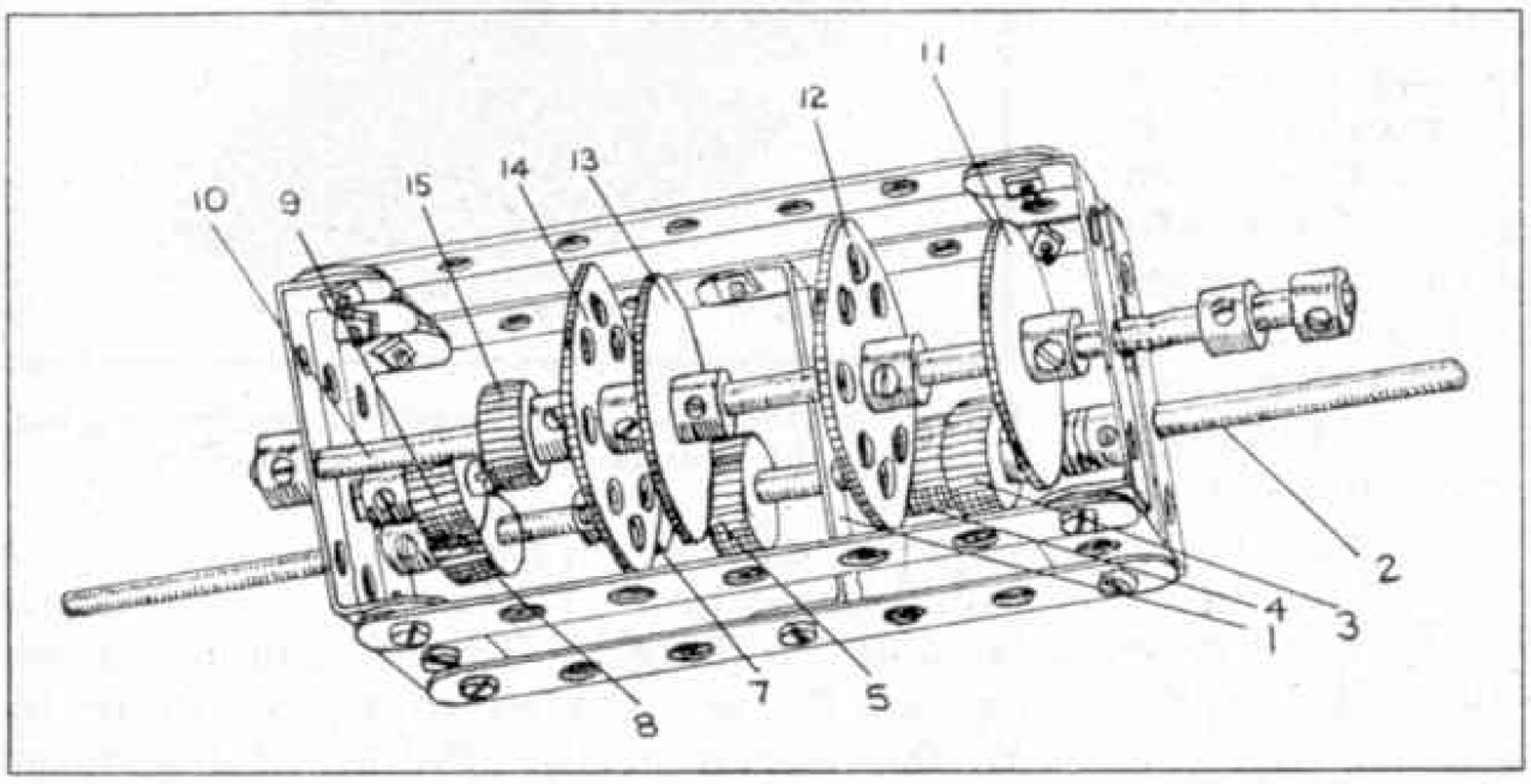


Fig. 3. L. Wilson, Bristol, is the designer of this three-speed and reverse gear-box. In this illustration bottom gear is shown in engagement.

A Neat Gear-Box

L. Wilson, Bristol, has designed a useful three-speed and reverse gear-box, which I am illustrating in Figs. 3 and 4 on this page. The illustrations are reproduced from original sketches prepared by Wilson.

The frame work of the gear-box is constructed from 3½″ × ½″ and 1½″ × ½″ Double Angle Strips. An intermediate bearing is formed by a further 1½″ × ½″ Double Angle Strip 1 spaced from the sides by Washers.

The input shaft 2 passes through the centre hole of one of the 1½″ × ½″ Double Angle Strips, and is fitted with a Collar, three Washers, a ¾″ Pinion 3, and a ½″ Pinion 4, before it passes through the intermediate bearing.

The output shaft is fitted with two ½″ Pinions 7 and 8, and a ¾″ Pinion 5, the bore of which serves to support one end of the input shaft.

The layshaft 10, carries a 50-teeth Gear 11, a 57-teeth Gear 12, another 50-teeth Gear 13, a further 57-teeth Gear 14, and a ½″ Pinion 15. On one end of the layshaft, outside the gear-box, are two Collars, between which a Threaded Pin or a short Rod engages.

A ¾″ Bolt fastened to one of the 1½″ × ½″ Double Angle Strips, holds a ½″ Pinion 9 in mesh with Pinion 8.

Bottom gear is obtained by sliding the layshaft to the extreme left, until gears 4 and 12, 5 and 13 mesh. Middle gear is obtained by sliding the layshaft to the right until Gears 7 and 14 mesh, Gears 4 and 12 being still in engagement.

Top gear is brought into operation by sliding the layshaft still further to the left, so that Pinion 3 and Gear 11 engage.

The reverse movement is provided by Pinion 15 engaging Pinion 9.

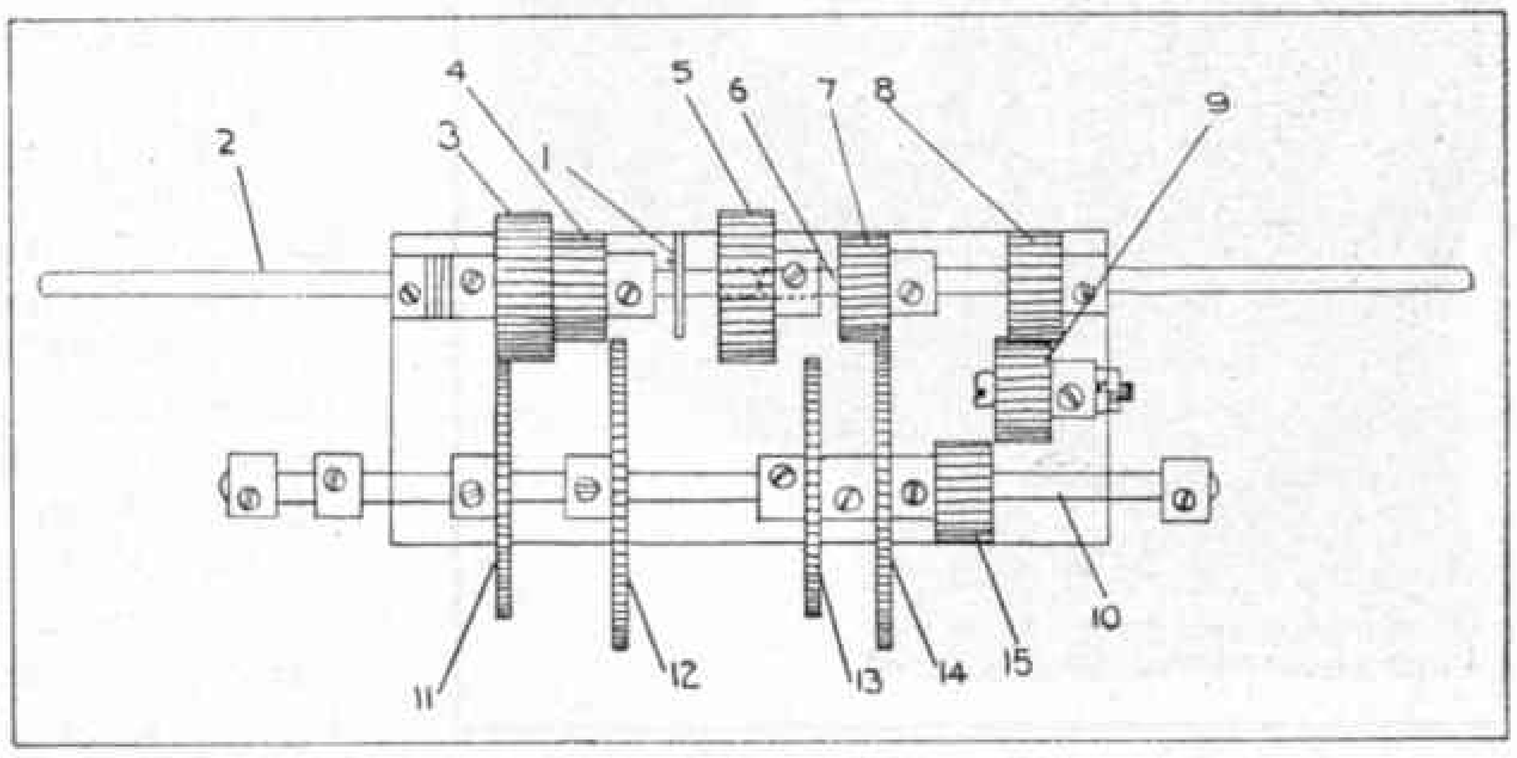


Fig. 4. This illustration shows how top gear is obtained in L. Wilson's gear-box.

New Meccano Model

Mechanical Mixer

THE model shown in Fig. 1 represents a mechanical mixer of a type used in various industries where the thorough stirring and mixing of solutions is an essential operation.

The sides of the column are 9½″ Angle Girders and are bolted together by 2½″ Angle Girders at the bottom. The 2½″ and 7½″ Strips 1 are bolted to the top, and the sides are filled by various sizes of Flexible Plates and one 9½″ Strip Plate. The mechanism for raising the container is built by fixing a 2½″ × 1½″ Double Angle Strip 2 inside the column, and a 3″ Screwed Rod carrying a Pinion and a Threaded Boss is mounted in it. The Pinion engages with a 1½″ Contrate Wheel 3, which is locked on a 2″ Rod journalled in the side of the column and in a Double Bent Strip. A Steering Wheel is placed on the end of this Rod. A 1⅛″ Bolt is locked in the Threaded Boss and is attached to a 2½″ × 1½″ Flanged Plate 4. This Plate is free to move between the 9½″ Angle Girders, but is retained in place by the small projection of the face of the Plate beyond its flanges. Two Fishplates forming guides are spaced from the Plate by Washers, one of the Bolts holding them being shown at 5. A 1½″ × ½″ Double Angle Strip and a Reversed Angle Bracket are also bolted to the Flanged Plate.

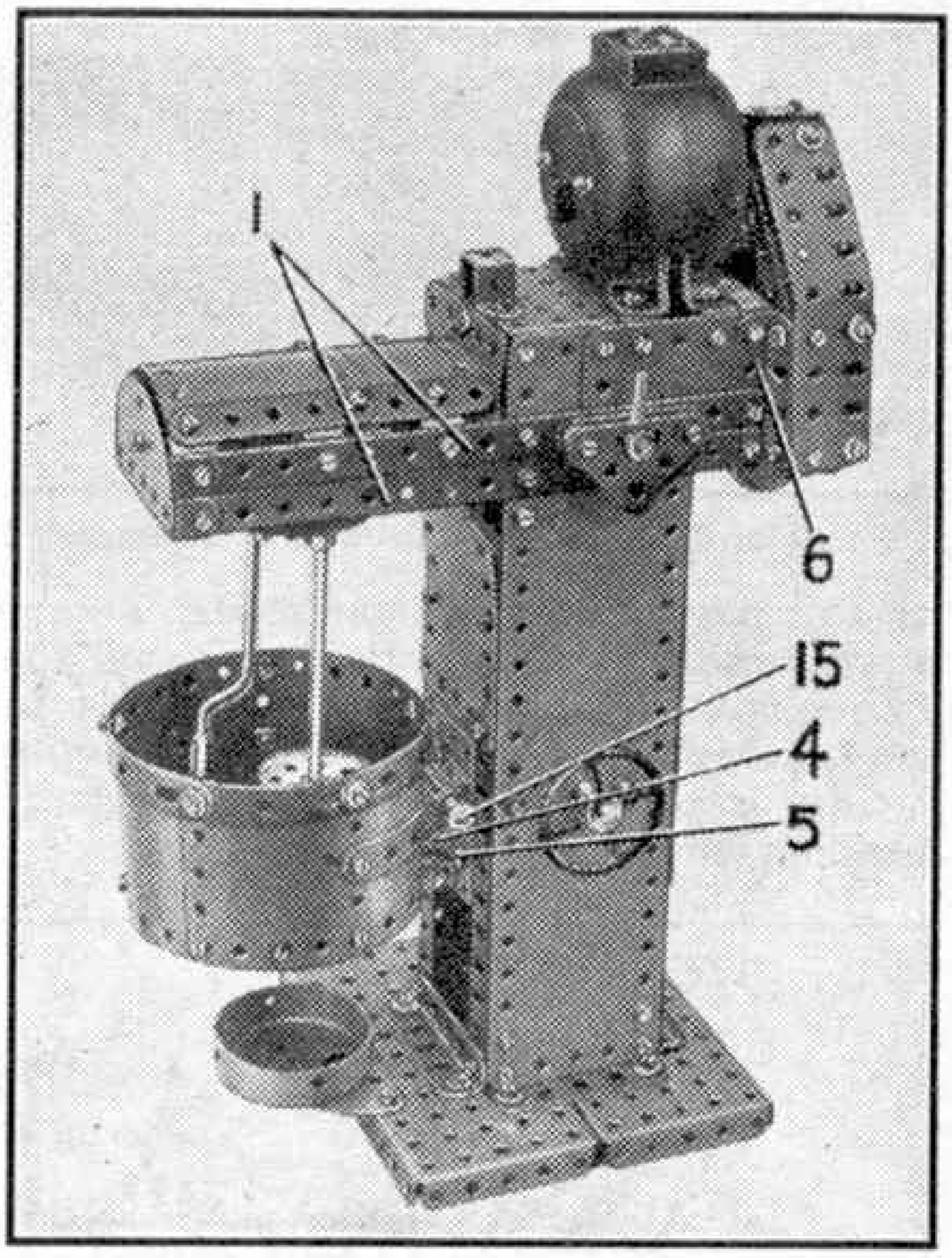


Fig. 1. A general view of the electric mixing machine that is the subject of this month's new model.

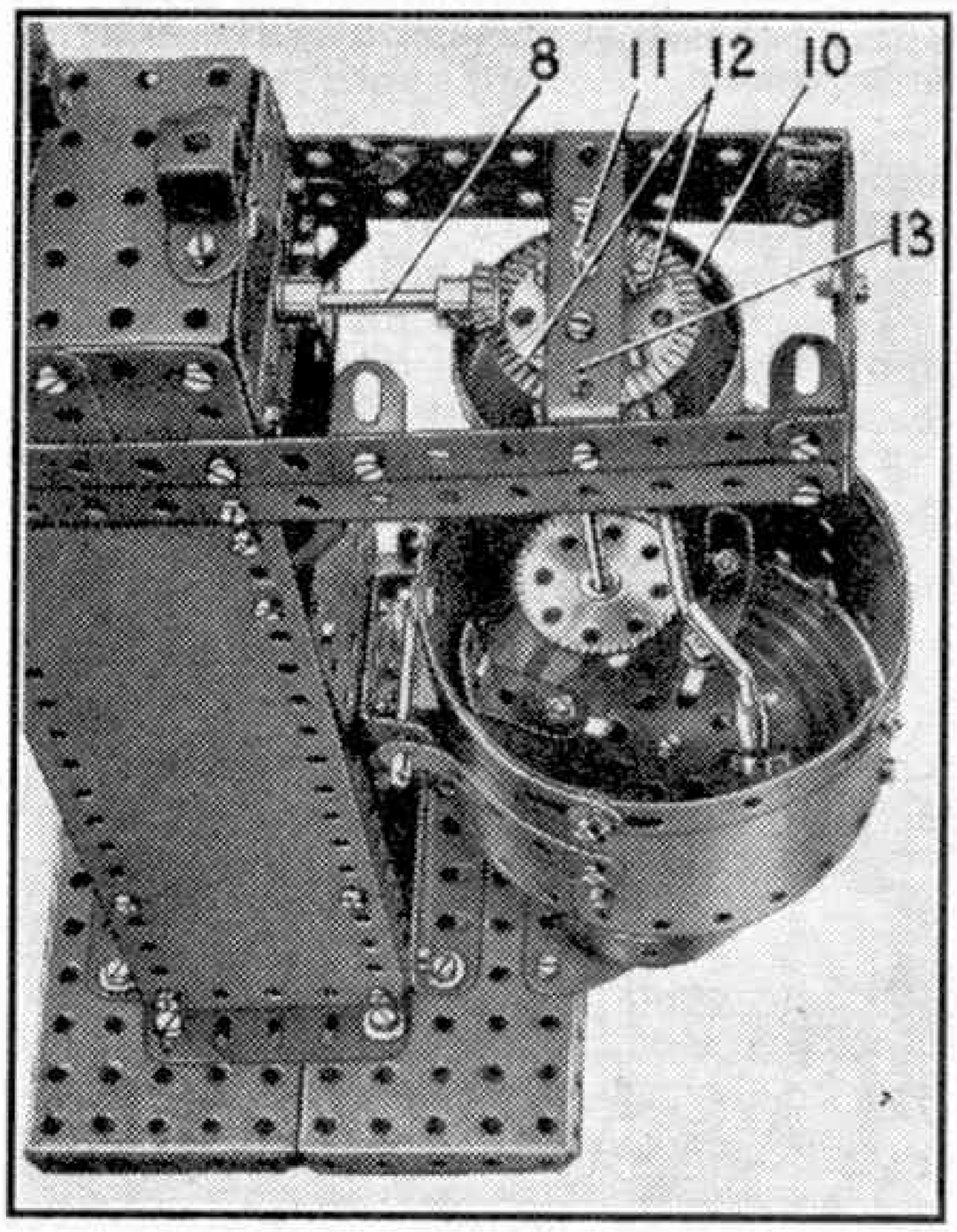


Fig. 2. A top view of the mixer showing the arrangement of the drive to the rotating blades.

The 7½″ Strips at the top of the column are extended upward by 2″ Angle Girders 6 and 2½″ × 1½″ Flexible Plates. These Plates are connected by a 2½″ × 1½″ Flanged Plate and three 2½″ × ½″ Double Angle Strips, and an E020 Electric Motor is bolted to them as shown.

The Corner Brackets representing the lever quadrant are spaced from each other by Collars, and from the column by three Washers.

A ¾″ Sprocket Wheel on the Motor is connected by a length of Chain to a 3″ Sprocket 7 mounted on a 6″ Rod 8. This Rod is journalled in the 2½″ Strips at the top of the 9½″ Angle Girders. The Sprockets are enclosed in a gear-casing made by attaching two 4½″ Flat Girders to Angle Girders 6 and connecting them at the top by two Obtuse Angle Brackets. The back of the casing consists of two 2½″ × 1½″ Flexible Plates and two semi-circular Plates attached to the Flat Girders by two 2″ Angle Girders. These are edged by 2½″ Curved Strips and 3″ Strips. The

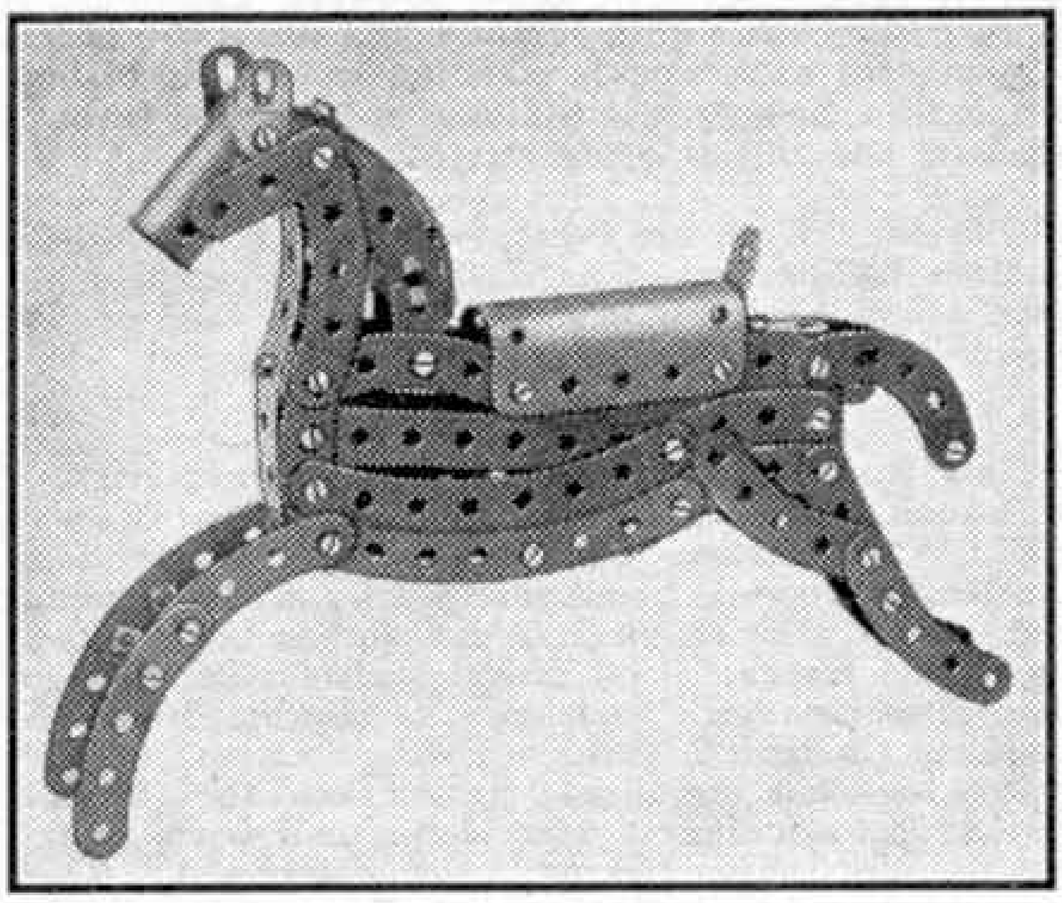
column is bolted to a base consisting of two $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plates.

The 5" Rod 9 and Crank Handle are mounted in a Boiler End 10, Rod 9 also carrying a $\frac{1}{2}''$ Pinion that engages a similar part locked on a 2" Rod 11 inside the Boiler End. A $1\frac{1}{2}''$ Bevel Gear is passed over Rod 11 and also over two $\frac{3}{4}''$ Bolts 12, which are fixed to the Boiler End. Several Washers space the Pinions from the Bevel, which is then locked on the $\frac{3}{4}''$ Bolts. Rod 11 is locked in a Double Arm Crank bolted to a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 13, and arranged so the $1\frac{1}{2}''$ Bevel and $\frac{1}{2}''$ Bevel on Rod 8 mesh correctly.

The $7\frac{1}{2}''$ Strips 1 are connected at the end of the arm by two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips to which a Semi-Circular Plate is bolted.

The container is constructed by attaching two $5\frac{1}{2}'' \times 2\frac{1}{2}''$ and one $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate by $1'' \times 1''$ Angle Brackets to a Flanged Disc. The Plates are edged by Formed Slotted Strips, and two $2\frac{1}{2}''$ Strips 14 are bolted to the side and bent as shown. The container is attached by passing a $2\frac{1}{2}''$ Rod 15 through the Strips 14 and through the Double Angle Strip on the $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate 4.

Parts required to build the model Mechanical Mixer: 4 of No. 1a; 4 of No. 4; 12 of No. 5; 4 of No. 8; 4 of No. 9d; 4 of No. 9e; 4 of No. 10; 5 of No. 12; 5 of No. 12a; 6 of No. 12c; 1 of No. 14; 1 of No. 15; 1 of No. 16a; 2 of No. 17; 1 of No. 18b; 1 of No. 19g; 3 of No. 26; 2 of No. 28; 1 of No. 30a; 1 of No. 30c; 140 of No. 37; 12 of No. 37a; 46 of No. 38; 2 of No. 45; 1 of No. 47; 1 of No. 48; 7 of No. 48a; 2 of No. 51; 2 of No. 52; 14 of No. 59; 1 of No. 62b; 1 of No. 80c; 2 of No. 90; 1 of No. 94; 1 of No. 95b; 1 of No. 96a; 2 of No. 103c; 2 of No. 111; 2 of No. 111d; 1 of No. 124; 2 of No. 126a; 2 of No. 133; 2 of No. 162a; 1 of No. 168a; 1 of No. 185; 7 of No. 188; 3 of No. 190; 1 of No. 190a; 2 of No. 191; 3 of No. 192; 1 of No. 196; 2 of No. 200; 4 of No. 214; 5 of No. 215; 1 E020 Electric Motor.



This realistic horse is a typical example of the kind of models suitable for entry in the "Birds and Beasts" Contest announced on this page.

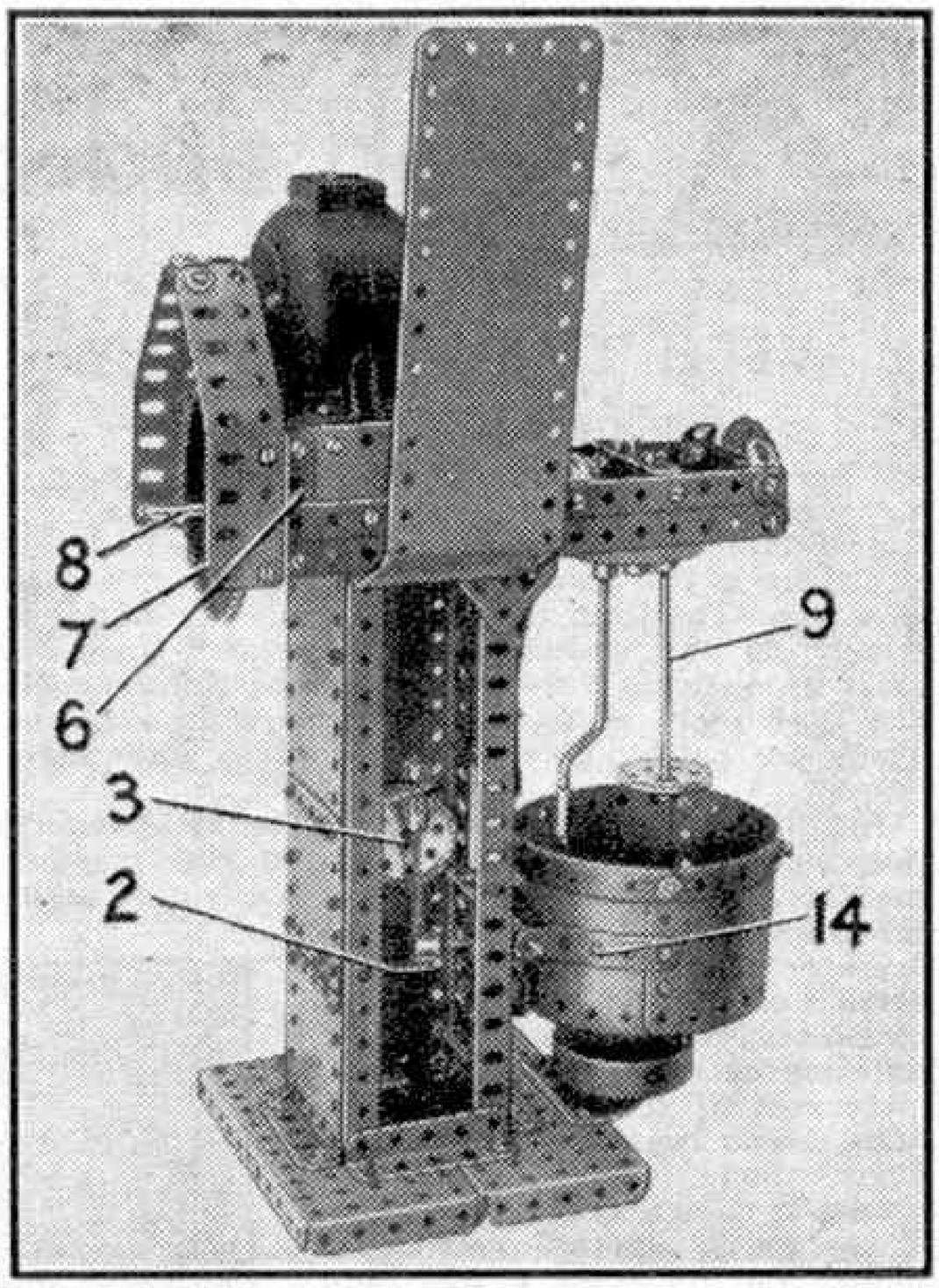


Fig. 3. The mixing machine with the side plates removed to show the mechanism for raising the container.

"Birds and Beasts" Competition

This month we announce a novel model-building contest that should appeal to all model-builders, and we hope every reader will set to work and send in an entry. The competition is for models of birds and beasts of any kind, and under this heading we include fish, insects, reptiles—in fact every living creature except human beings!

Models may be constructed with any size of Outfit and there are no restrictions on the number of parts that may be used, but owners of small Outfits should find the contest particularly interesting. Amazingly life-like models of living creatures can be constructed with only a few simple parts, as the illustration of the leaping horse on this page shows. It will be seen that this particular model is in full section, but competitors may also design their models in the flat or half section. Great ingenuity can be shown in devising mechanisms for reproducing animal movements, so that the competition offers very wide scope for originality. Some creatures are particularly suited for caricature or humorous construction.

When their models are completed competitors should send photographs or drawings of them to "*Birds and Beasts Contest, Meccano Limited, Binns Road, Liverpool 13.*" The competitor's age, name and address must be written on the back of each illustration submitted.

As usual the contest will be divided into separate sections for Home and Overseas readers. Entries in the Home section must reach this office not later than 31st July, but the Overseas section will remain open until 31st October.

The following prizes will be awarded in each section: First, Cheque for £3/3/-; Second, Cheque for £2/2/-; Third, Cheque for £1/1/-. There will be also five prizes each consisting of a Postal Order for 10/6, and five awards of 5/- each. In addition Certificates of Merit will be awarded to those competitors whose entries just fail to reach prize-winning standard.

Club and Branch News

WITH THE SECRETARY

OUTDOOR PROGRAMME HINTS

I have been asked by one or two Clubs to suggest a programme for the summer months. Really a Club's outdoor programme should be settled by now, but there is still time to arrange a series of outdoor meetings. The form these should take depends very largely on the wishes of members and their own ideas of open air recreation, but apart from games and Club room work there are four main activities. These are rambling, cycling, swimming and photography.

In all these pursuits there must be some definite purpose behind every meeting. To call members together just to go for a walk or a run is only asking for trouble. It should be clearly known to begin with where a ramble or a cycle run is to take members, with arrangements for refreshments, while the approximate cost of such things as bus fares should be announced beforehand. Some place of interest should be chosen as the destination of the party, whether walking or riding, and for some of the outdoor meetings this should be an open air space where members can roam and play games.

Those in charge of a cycling section should make it a rule that members should keep well together, and their behaviour on the road must be carefully watched in the interests of safety.

Safety considerations also apply to the activities of a swimming section. Some Clubs will find it necessary to restrict their activities to public baths, but others may be fortunate enough to have ready access to the sea or some open air bathing pool. In all cases it must be understood that older members who are experienced swimmers shall keep an eye on the younger ones. It always seems to me essential that life-saving, at least in its more elementary aspects, should form part of the proceedings of a Club swimming section.

Lastly comes photography. The leader of the section concerned should take care to select routes for excursions that provide ample opportunity for the hobby, and it is a good plan to arrange competitions, members being asked to take photographs of some particular object or scene, the subsequent prints being carefully judged and exhibited for comparison. Contests of this kind will quickly raise the standard of photographic work.

It is not necessary to run these sections entirely independently. There should be plenty of opportunity for combining their activities, and a little ingenuity in making arrangements for outdoor excursions will lead to this desirable result.

CLUB NOTES

Fallow Court (Finchley) M.C.—The Club's Social and Display interested a large number of parents and friends of members, who enjoyed the models shown and the Dinky Toys Town, an extensive layout with 20 ft. of pavement. Games, Puzzles and a Quiz were enjoyed, and Refreshments were provided. Club roll: 13. *Leader:* Mr. W. Laming, 88, Fallow Court Avenue, Finchley, London N.12.

Hornsea M.C.—An outstanding event has been a visit to a shipyard at Beverley, where members saw each stage of the work from the Drawing Office to actual construction. Films have been shown and Games played. Excellent Model-building also has been a feature of recent weeks. Club roll: 15. *Secretary:* R. Lancaster, Carlton House, Carlton Avenue, Hornsea.

AUSTRALIA

Maylands M.C.—Regular Games programmes and a Film Show have been given, and members have enjoyed a bus and cycle run to Coogee, for swimming and fishing. Work has been started on models for the Faction Exhibitions. The Fretwork Section also has been busy. Club roll: 40. *Secretary:* V. Chester, 16, Kennedy Street, Maylands, Australia.

A group of members of the New Road Model Railway Club, H.R.C. Branch No. 510, incorporated in June 1948. Mr. G. C. Flowers, Chairman, is seated in front, with A. Bishop, who until recently was secretary, on his right. T. Hinton, the present secretary, is standing behind A. Bishop. The Branch has an extensive layout, with stations and lineside features built by members, and this is being electrified.

BRANCH NEWS

New Road Model Railway (Buckhurst Hill)—A Branch track was shown in an Exhibition at Conway Hall, Walthamstow, by invitation. The layout in the Branch room is being enlarged by a new terminal station and a goods yard. A bridge has been erected across the tracks. Good progress also is being made with electrification. *Secretary:* T. Hinton, 109, Hall Lane, S. Chingford, London E.4.

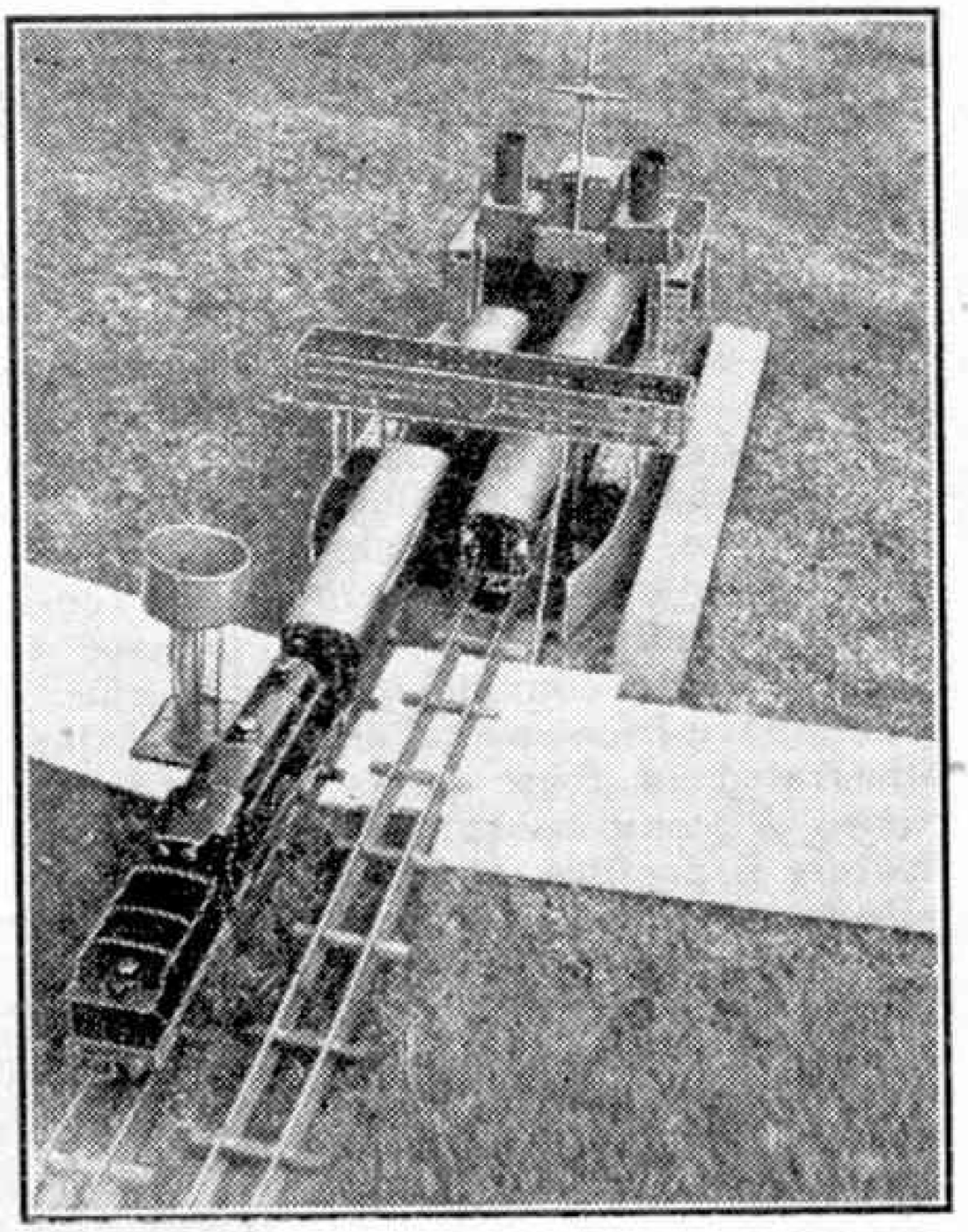
Slough—The terminal station on the Branch Layout is beginning to take shape, and parts of the curved roof have already been completed. Good progress has been made with other constructional work, which includes the building of trestles for carrying the track. *Secretary:* W. Eisele, 335, Farnham Road, Slough, Bucks.

My Hornby Train Ferry

By H. E. H. Howell

A YEAR or two ago I was fortunate enough to travel to the South of France. I had to wait in Calais for a few hours on the return journey and it was very interesting to wander around and see the traces of all the battles for that ancient port. The most fascinating experience however was to stand on the quay and watch the rolling stock being taken on to the train ferry steamer there.

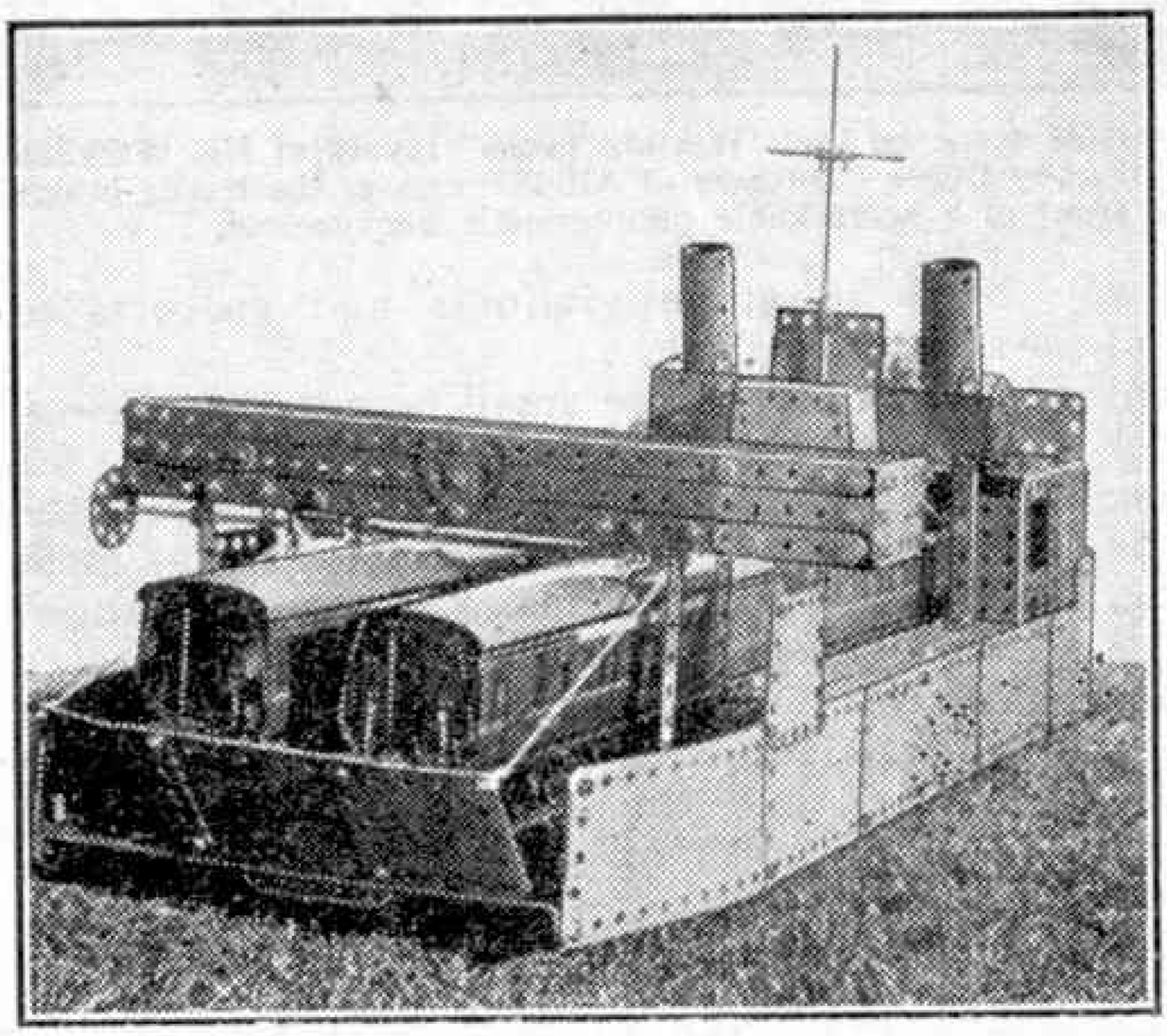
Ever since then I wanted to have a model train ferry of my own, so recently I set to work with my Meccano to try to realise my ambition. I based my plans on a picture I had of one of the real vessels, but I realised that I would have to modify the design somewhat if I wanted a ship sufficiently handy to use in conjunction with my Hornby Gauge 0 layout. The ship is of course not a floating model but runs on wheels enclosed within the hull. To navigate the vessel I have, luckily, been able to borrow a large reel belonging to a sea-fishing rod which carries over 150 ft. of stout line. This is attached to the hull while the ship is berthed "across the channel"—actually at one side of our lawn—and the line is run out until I reach the other side.



Hornby rolling stock being drawn off the ferry ship at the quay.

Then I steadily reel in the line that tows her and this gives a most realistic effect as the bluff-bowed craft breasts her way across the grassy "waves." I make the ship go astern until she has backed against the quay and the stern flap is then dropped. This fits exactly under the projecting rails on the quayside so that the "mainland" track is connected with that aboard the train ferry. Within a few minutes all is ready and my Hornby 4-4-0 "Standard Compound," a pre-war L.M.S. model, is able to draw the carriages from the interior of the ship. The full train is soon assembled and then sets off on its rail journey. The upper photograph shows this transhipment operation in progress.

The train-ferry, which has a length of 32 in. and a beam of 12 in., can accommodate either four No. 2 Passenger Coaches or eight goods vehicles. So in either case the two tracks in the ferry-ship convey a reasonable train. The stern flap bridge was constructed to allow Dinky Toys vehicles to be driven on to it and conveyed on board as well as the railway units. Thus the ferry is able to perform, in miniature, all the functions of the real thing and its use involves some novel working.



The Meccano-built train ferry of reader H. E. H. Howell, showing rolling stock on the after deck. The stern flap is partly lowered to show its action.

Hornby-Dublo Lineside Schemes

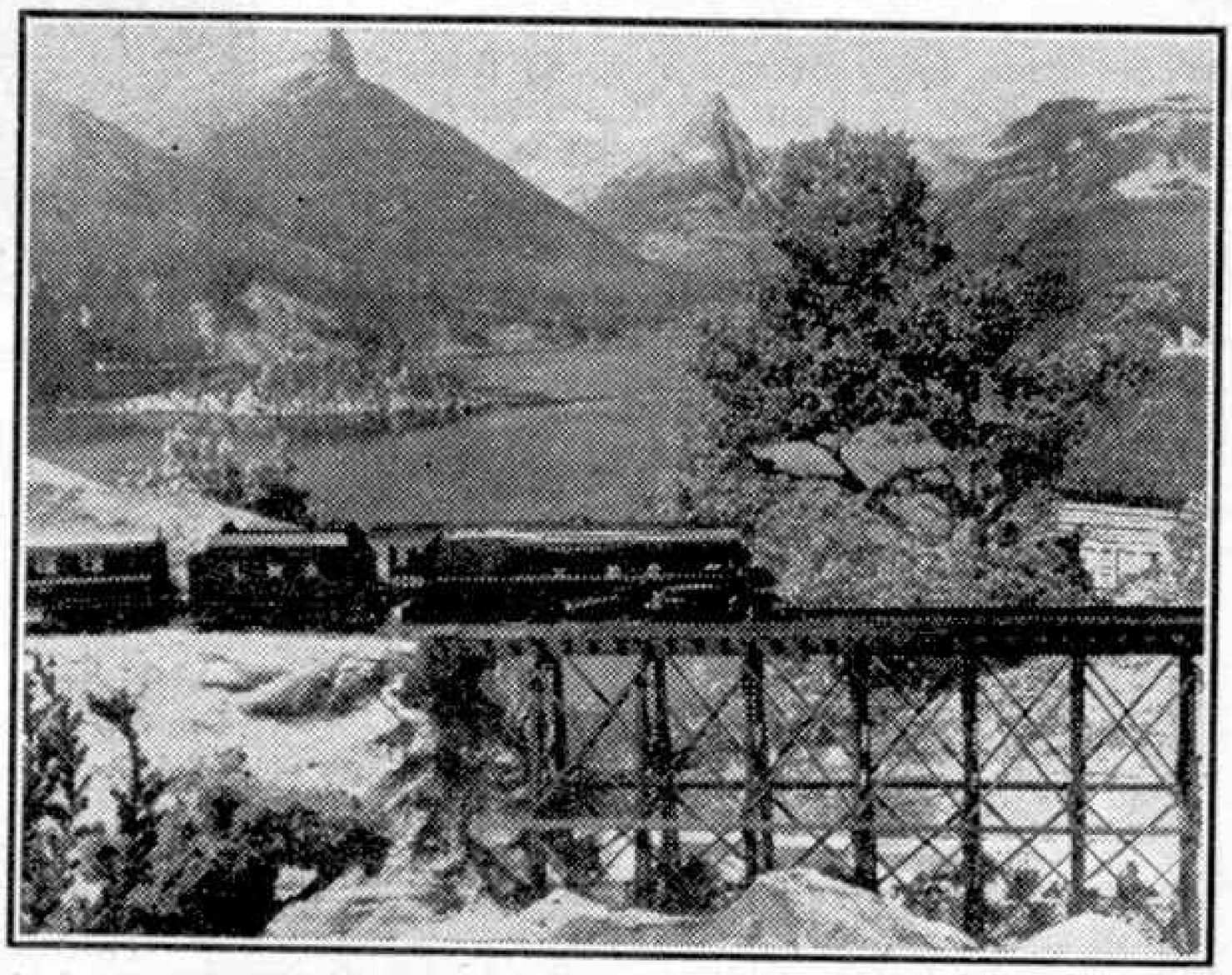
THE lineside arrangements of any miniature railway have a considerable effect on the realistic appearance of the system. It is not often possible nowadays to have elaborate scenic effects at the lineside owing to space restrictions and the fact that so many miniature railways have to be of the portable kind.

In spite of such difficulties, however, many Hornby-Dublo owners manage to arrange quite convincing lineside effects. There have been several examples of these illustrated in these pages from time to time. A scenic background, where such a feature is possible, gives an effect of depth to the layout and immediately gives the railway a natural setting. It is not always possible, to include such features on the smaller kind of layout that has to be put down on a table top or board. If the board or table is arranged next to the wall of the room, however, then there is the possibility that the back scene can be arranged along the side against the wall.

A length of thick card or plywood can be used and on this the features of the countryside or town required can be drawn and coloured. Those unable to do such work can often persuade a friend who is gifted in this way to carry out what is necessary. Sometimes it is possible to build-up a scene by colouring the actual background and then pasting on suitable coloured features cut out from magazines and other publications. If care is taken in cutting and matching the different pieces, the finished job can be quite convincing.

A splendid example of background is shown in the picture on this page. Here a large coloured photograph shows "Phantom Lake," situated alongside the trestle bridge carrying the "Western Lines" railway. This is a system based on British and American practice that is operated by Mr. Walkden Fisher, of Southport, jointly with four friends. The original system from which the present scheme was developed was described in the *"M.M."* in June 1940.

The trestle bridge is itself an interesting piece of work, but such a feature can only be provided where the arrangement of the baseboard is such that the track and the substructure can be at different levels. This "Western Lines" bridge was built of stripwood. Other materials can be used according to the type of bridge being modelled. The ordinary plate girder bridge, for instance, can be modelled effectively in cardboard, with a wood floor to carry the rails. Similar methods can be used to reproduce the familiar brick or stone viaducts and culverts of actual practice.

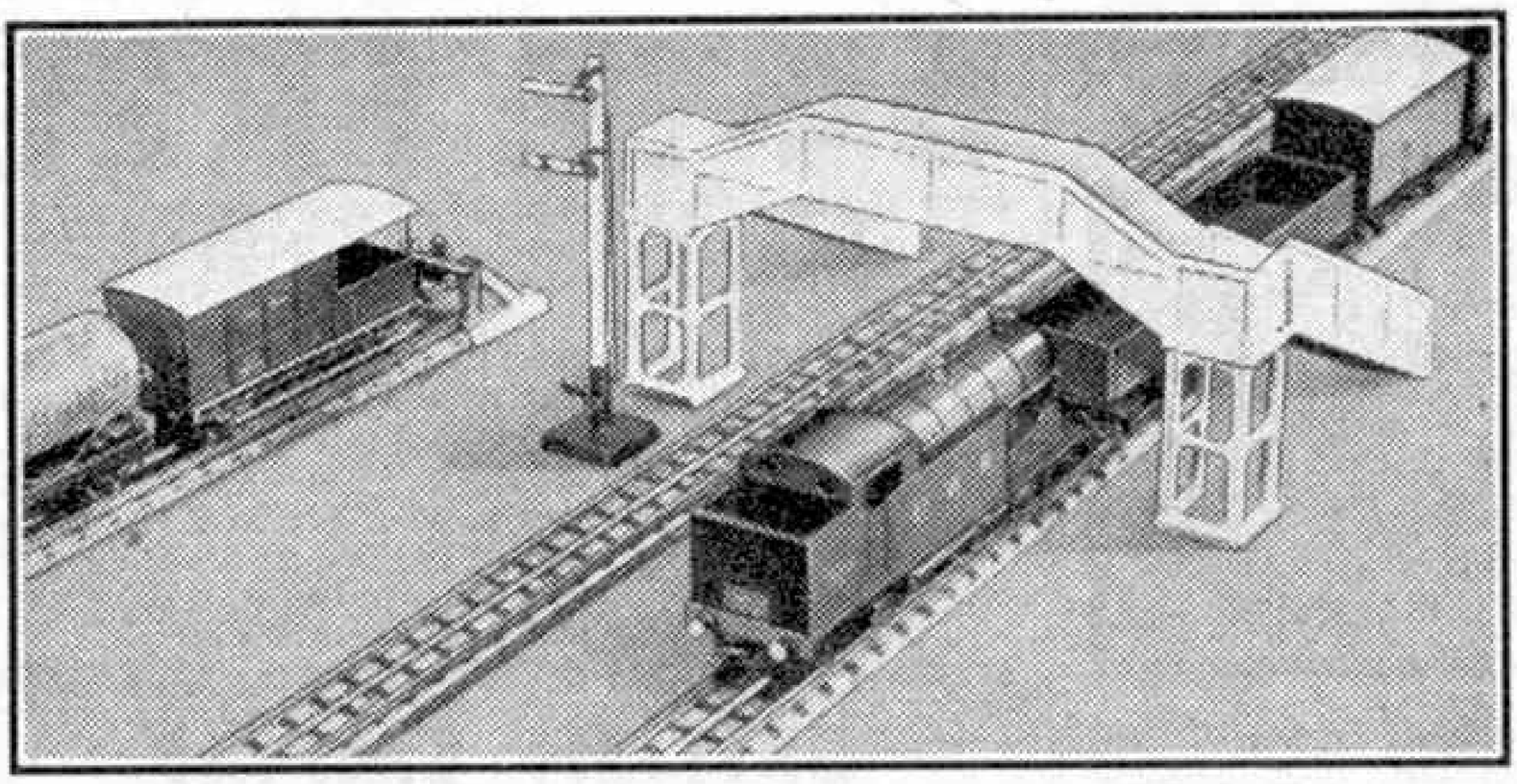


A striking lineside scene on the "Western Lines" layout of Mr. Walkden Fisher. The Hornby-Dublo "Duchess of Atholl" crosses the trestle bridge in front of a remarkable photographic background.

On the average small layout the railway track often lies near to the edge of the table or board, which has to be in the centre of the room. This means that most lineside features have to be arranged inside the main track. It is possible as a rule to leave enough space outside the railway for such necessities as signals or fencing, and the latter in particular does help to finish off the track in a suitable manner.

Some readers have made use of the fencing formerly available for Hornby Gauge 0 railways, but as this is not in production now it is frequently necessary to make up one's own fencing at home.

This can be done fairly simply with card or thin wood. If card is used a solid fence, or often a wall, is represented by drawing or painting the necessary details on suitable card strips. Otherwise the thin wooden spills that can be bought at



The realistic style and proportions of the Hornby-Dublo Footbridge are well shown in this illustration. As will be seen the Footbridge can span a double track.

times can be used to build up a pleasing fence with the aid of a little glue.

It may be possible to arrange some fencing inside the main track where the layout of the rails permits this. On the other hand the space inside the track can be used effectively for miniature roads with one or two buildings that can be simply made in cardboard or thin wood. Often the simplest accessories of this character have a surprisingly good effect if reasonable care is taken in their construction and painting.

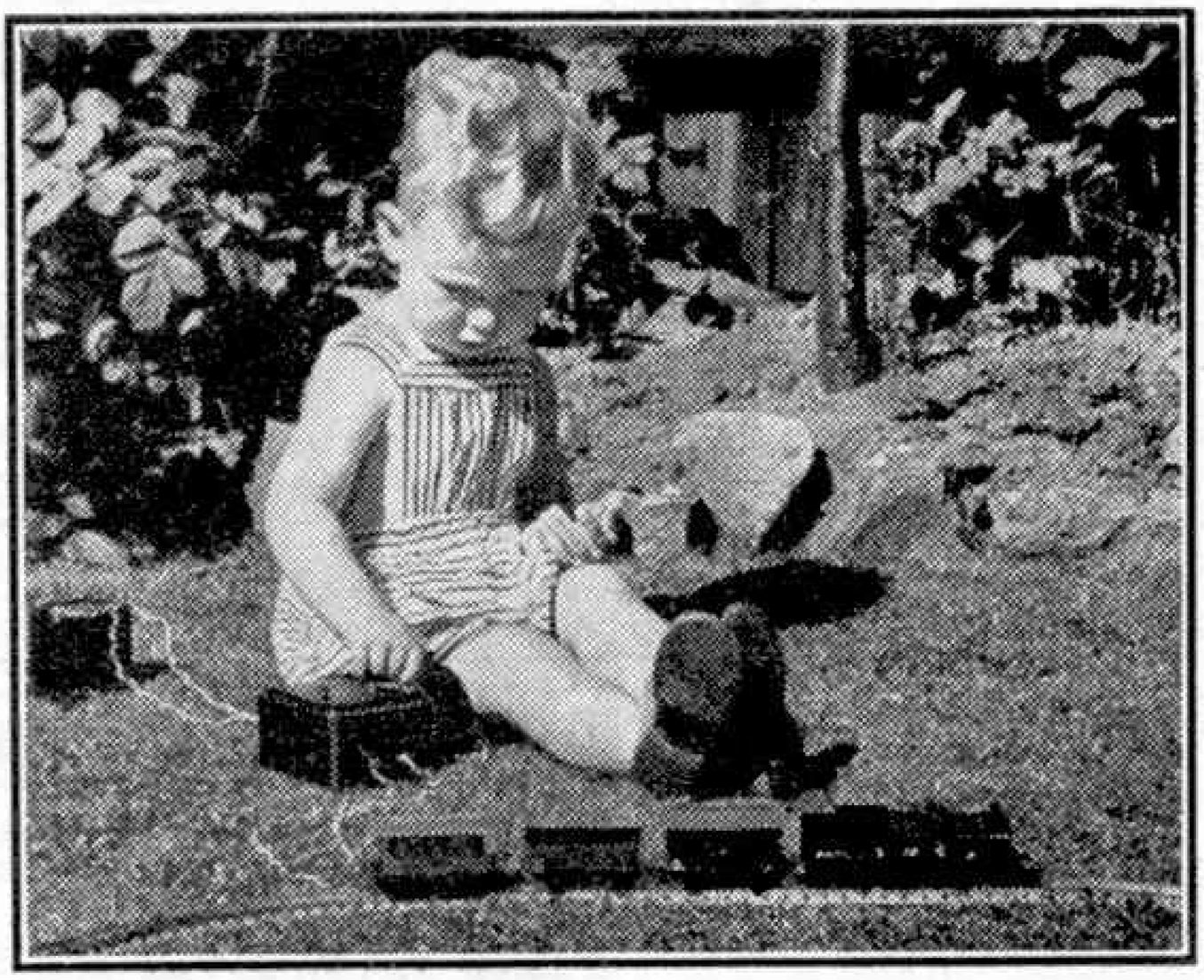
Natural effects do not trouble the Hornby-Dublo owner who uses his railway outside on a warm day. He has plenty of "countryside" ready made, or at least he has the means of providing it. If the railway is normally laid on a board its transfer from indoors to outside will not be very difficult.

There are various Hornby-Dublo Accessories that must form part of the railway lineside. Signals, for example, should be arranged where required, as at stations, and to protect any Points that may be incorporated in the layout. It may not be possible to signal the line completely but this need not interfere with the realism as long as the correct principles are observed. We shall have more to say about the use of Hornby-Dublo Signals in a later article.

Other Hornby-Dublo items include the Water Crane that has been referred to once or twice in the *"M.M."* recently. This can be used very well at the ends of platforms, just about where the engines stop. In addition any siding or yard where engines can be expected to be at work, or to stand for some time, can be provided with a Water Crane.

A most effective accessory of recent introduction is the Hornby-Dublo Footbridge. This represents the modern reinforced concrete type of structure, and it looks most realistic when spanning the track. It can be used at the ends of station platforms, or it is very effective out in the "country." The Footbridge consists of three main parts that are easily fitted together according to the instructions packed with it. A good idea of the assembled Footbridge, with its realistic stairways, can be got from the upper illustration on this page.

When placing the Footbridge on a layout, care must be taken to see that it does not interfere with the sighting of the signals from track level.



Martyn Pendlebury, of Knighton, Leicester, evidently regards the running of his Hornby-Dublo Train as a matter of importance. This young enthusiast is already a skilled "driver."

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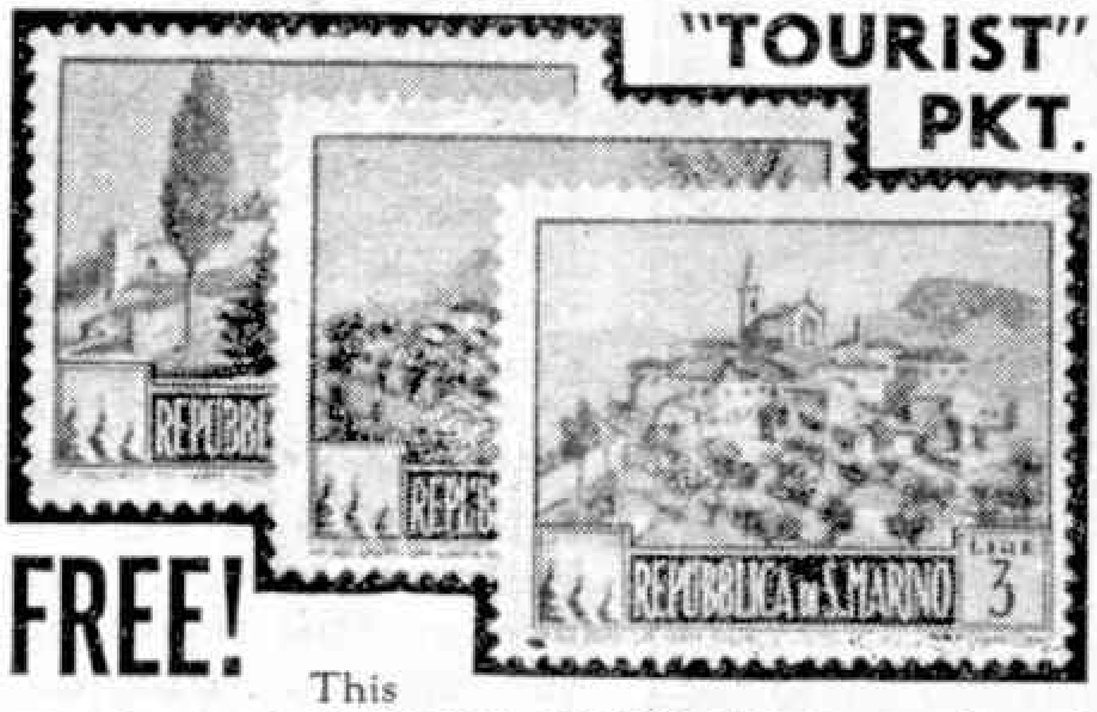

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Stamp Collecting

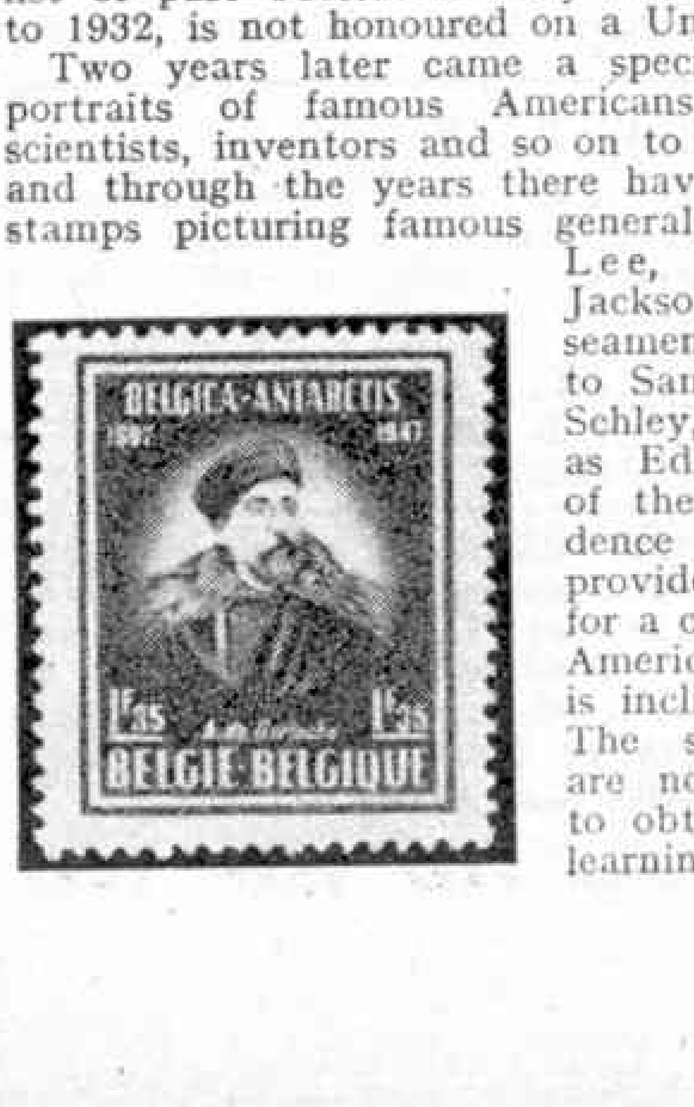
Portraits

By F. Riley, B.Sc.

MOST early stamps were of the portrait type, apart from such examples as the Brazilian Bull's Eyes and the Swiss numerical issues. The portrait was that of the reigning monarch, a tradition that began with the appearance of that great original, the British "Penny Black." Throughout the 110 years that have elapsed since its appearance, British stamps, with one or two exceptions, have remained faithful to this ideal, but other countries have been more venturesome, and in the last 50 years or so pictorials have become common. Portrait designs too have flourished, and pictures of famous men have been added to those of rulers as subjects for them. It is these designs we are now concerned with, to the exclusion of those bearing portraits of reigning sovereigns or heads of states.

This development has created wonderful opportunities for stamp lovers to build up collections of the type now usually described as thematic. It is only necessary to consider such a country as the United States to see to what lengths the practice of issuing portrait stamps has gone. No matter how famous a President of the U.S.A. may be his portrait does not appear on a stamp until after his death, so that the long list of U.S.A. stamps with portraits of American Presidents can be regarded as stamps within our scope. The outstanding series appeared in 1938–39, in which portraits of every President from George Washington to Calvin Coolidge appeared, and to give full measure portraits of Benjamin Franklin and Martha Washington also were included in the set. Portrait stamps of Franklin D. Roosevelt have appeared since 1945, and of the list of past Presidents only Herbert Hoover, 1928 to 1932, is not honoured on a United States stamp.

Two years later came a special series carrying portraits of famous Americans, authors, poets, scientists, inventors and so on to the number of 35, and through the years there have been a series of stamps picturing famous generals, such as Grant, Lee, Sherman and Jackson, admirals and seamen from Paul Jones to Sampson, Dewey and Schley, inventors such as Edison, great figures of the War of Independence and so on. These provide ample material for a collection of famous Americans if any reader is inclined to make one. The stamps themselves are not usually difficult to obtain or costly, and learning sufficient about each of the famous men concerned to provide a good write-up will be of the greatest interest.



It would be a large task to make a collection of all portrait stamps, and to mount these and write up the great men represented. Such a task would be well worth while for those with leisure to pursue it, but to begin with a more restricted plan could be followed. A survey of the portrait stamps of all countries reveals the fact that there is ample scope for the collector who has a special interest in any particular direction. For instance, those who are attracted by artists and their works would have no difficulty in finding many who have been honoured by the issue of stamps. From Belgium we have a portrait of Paul Rubens; Italy will supply portraits of Leonardo da Vinci, and Goya represents Spain. Great authors too provide material for another interesting collection. Shakespeare can be included in this, although Great Britain has never honoured him by a stamp issue, for Hungary reproduced his portrait in an issue of 1948. Others to be represented in such a collection include Schiller and Goethe, Dante, Tolstoy and Turgenev, Cervantes, Hans Andersen of fairy tale fame, and Balzac, Victor Hugo, Moliere and Corneille.

The world's scientists have received recognition in many countries, and stamp issues with their portraits would be found very attractive indeed. Among them we find Röntgen, the discoverer of X-rays, Lavoisier, one of the world's greatest chemists, and Kamerlingh Onnes, a pioneer of low temperature research. Sweden has given us portraits of von Linnaeus, the great botanist, and Berzelius, a famous chemist. The Curies, discoverers of radium, have been widely celebrated in France, where their discovery was made, in Poland, the native country of Madame Curie, and in Monaco; and a French stamp honours Becquerel, who was the actual discoverer of radioactivity.

No doubt many readers of the *"M.M."* are musicians, and there are excellent stamps in which they will delight. Czechoslovakia gives us a good start with Dvorak and Smetana. Finland has celebrated the fame of Sibelius, and both France and Poland have honoured Chopin. French composers whose portraits can be seen on stamps include Debussy and Massenet, and from Italy comes a stamp bearing a portrait of Rossini. Greig, Rimsky-Korsakov and Tschaikovsky are other famous composers whose stamp portraits can figure in a collection of famous musicians, and it is interesting to find that two of those celebrating Tschaikovsky include in their designs short passages from his works. Another example of music on stamps comes from Brazil, where a set in honour of the Brazilian composer Carlos Gomes was issued in 1936. One of the two stamps of this set is a portrait stamp; the other carries a few bars of his work.

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All these **ABSOLUTELY FREE.** This attractive scarlet stamp from **ANTIGUA,** the little British island in the West Indies, showing a picture of Nelson's Dockyard, **AND ALSO** unusual obsolete pictorial issued for the **RUSSIAN ZONE OF BERLIN, GERMANY,** showing the Ruins of Berlin after the War, **AND ALSO** several other stamps and an illustrated page; **ALL ABSOLUTELY FREE.** They will improve and add value to your own collection.

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For other Stamp Advertisements see also pages 280 and xv.

Stamp Gossip

and Notes on New Issues

By F. E. Metcalfe

SOME time ago it was rumoured that all the colonies were to have new stamps, showing a different portrait of the King. Up to now nothing has come of the story, but Australia has given us another new stamp, with a new portrait all right, and quite a good one too. Actually the stamp is an improvement on the one it replaces, but it could hardly avoid being that, for the old stamp is one of the poorest affairs that Australia has ever produced, and it must be admitted that some of the others were pretty moderate. As far as attractive stamps are concerned Australia is now doing better. In fact, as has been already mentioned, its "U.P.U." stamp was thought by some to be the most handsome of all the multitude of issues that came out ostensibly to commemorate the Postal Union.

While we are in this part of the world we may as well refer to an item of philatelic news which came as a surprise, from Fiji. Apparently this country is to bring out "Health" stamps, as does New Zealand, and if these stamps have anything like the popularity the New Zealand issues enjoy some fund is going to get a good fillip. All this opens a wide field, for the permission which has been granted represents a complete *volte face* on the part of our Colonial Office, for hitherto it has refused to sanction such issues, and now we can look out for more.

Before leaving Fiji we must refer to two handsome stamps, 10/- and £1 in value, which have just been issued there. It is surprising that Fiji did not have stamps of these values before, for they are certainly needed in these days of high air mail charges. Anyhow, the stamps have now appeared and they are beauties. Incidentally the Fiji rate is 10 per cent. below sterling, so if you buy these stamps now you will probably save money, for when Australia lifts its rate, as it no doubt will in time, the Fiji pound will also go up and then your Fiji stamps will cost you at least 10 per cent. more. So try and buy now if pocket money allows.

It was interesting news that American dealers are to be allowed to buy British Colonial stamps. Hitherto the Crown Agents, who handle the sale of these stamps, have only been willing to sell to registered British dealers and of course some of these dealers, who in turn have been supplying American dealers, are rather looking down their noses. But it is probable that in the long run the new step will benefit all collectors of KG VI stamps, for there should be a wider distribution in America in future. This can only result in more collectors taking up our stamps, and with so many collectors on the other side the possibilities are enormous.

Perhaps the most interesting news of the month comes from Barbados, for that most popular of all colonies is at long last bringing out its new set. Pictorials, of course, yet it is a question if the new set will ever be as popular as the one it is replacing. This, with all its shades and perforation varieties, has kept collectors on their toes for years. Those who bought all the stamps when available will reap a rich harvest, for more than one which only cost a copper is now worth several pounds. Good luck to the new set, but being printed by Bradbury Wilkinson, we are hardly likely to see the perforation changes that made the old set so interesting.

A good second in interest to the Barbados news is the Crown Agent's advice that a new set is also in preparation for Cayman Islands. There will be many collectors who would rate this first, for Cayman Islands is a very popular country, and apparently we are to have more pictorials. These pictorials have been very popular, and helped to make the KG. VI group the most popular of all time, but one collector in a magazine was bemoaning the loss of the present set of Mauritius when the new set, also pictorials, comes out. At present the set of Mauritius is of the key type, which many colonies used at one time, but they have dropped out one after the other until only Mauritius and Leewards Is. remain. It must be admitted that these key stamps are a change from the more flamboyant issues which have replaced them, yet they would be very boring if all the colonies had them. Which stamp do you like of the two types?

Air mail fans will be very disappointed at the news that the helicopter service for carrying mails in East Anglia has been declared too expensive to be allowed to continue. Apparently the Post Office is to be considered as merely a profit-making concern. So goodbye to an interesting experiment; no doubt some foreign government will learn from our experience and make a go of a very useful service, as we could have done had not profit been the only consideration.

A collector asks why the Leeward Island Colonies—Antigua, Montserrat, St. Kitts-Nevis and Virgin Islands—have not yet changed their stamps into dollar currency, as it was stated they would do. To be candid I do not know. It is a fact that if you send cash to Grenada for postage stamps, the Postmaster changes your sterling into dollars and then calmly sends you stamps in sterling currency. No doubt in time all our West Indian possessions will have their stamps picked out in dollars, as they say, but in the meanwhile countries like Caymans are bringing out a new set in sterling.

And here's a little tip. There are two quite distinct shades of the 3d. blue Barbados stamp which has just gone out. The catalogue only gives one, but in the long run both will probably be listed and then a stamp which costs coppers to-day will cost more than as many shillings later. Remember I told you once of a Barbados stamp easily obtainable for a shilling that now costs seventy. This 3d. blue will not be as good, but it will still be very nice. You must get both, for it is not easy to describe how to tell one from the other.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

"SEA ELEPHANT" AT SUEZ

On the night of 3/4th January, 1950, there was a storm over Suez, with a violent S.S.W. wind. Apparently this storm was the cause of the dead body of an animal being washed ashore on the very flat beach at Suez. At any rate, on the morning of the 4th several people travelling along the coast road that leads from Suez to the Anglo-Egyptian Oilfields Refineries noticed a large greyish mass on the shore.

At high tide the beach at Suez is entirely covered by the sea, and it was only at low tide, about 4 p.m., that the first observers could approach. Next day crowds began to gather, and later the town of Suez was shaken with the news that a strange animal, quickly named by the crowds a "sea elephant," had been washed ashore on a sand-bank. During the day, and on the following days at low tide, practically all the 125,000 inhabitants of Suez and Port Thewfik inspected the animal.

The animal presented a repulsive sight, with its muzzle like that of a giant dog, its tail covered by a gelatinous film, and its hide showing deep wounds from which oozed a sanguinary and slimy liquid. A pestiferous odour infected the air. It was thought that the Norwegian tanker "*Cornelius Maersk*" sailing south must have collided with the animal and slashed its hide with its propeller.

C. MINACOULIS (Port Thewfik, Egypt)

A strange sea creature cast ashore near Suez. Photograph by C. Minacoulis, Port Thewfik.

A VETERAN MOUNTAIN CLIMBER

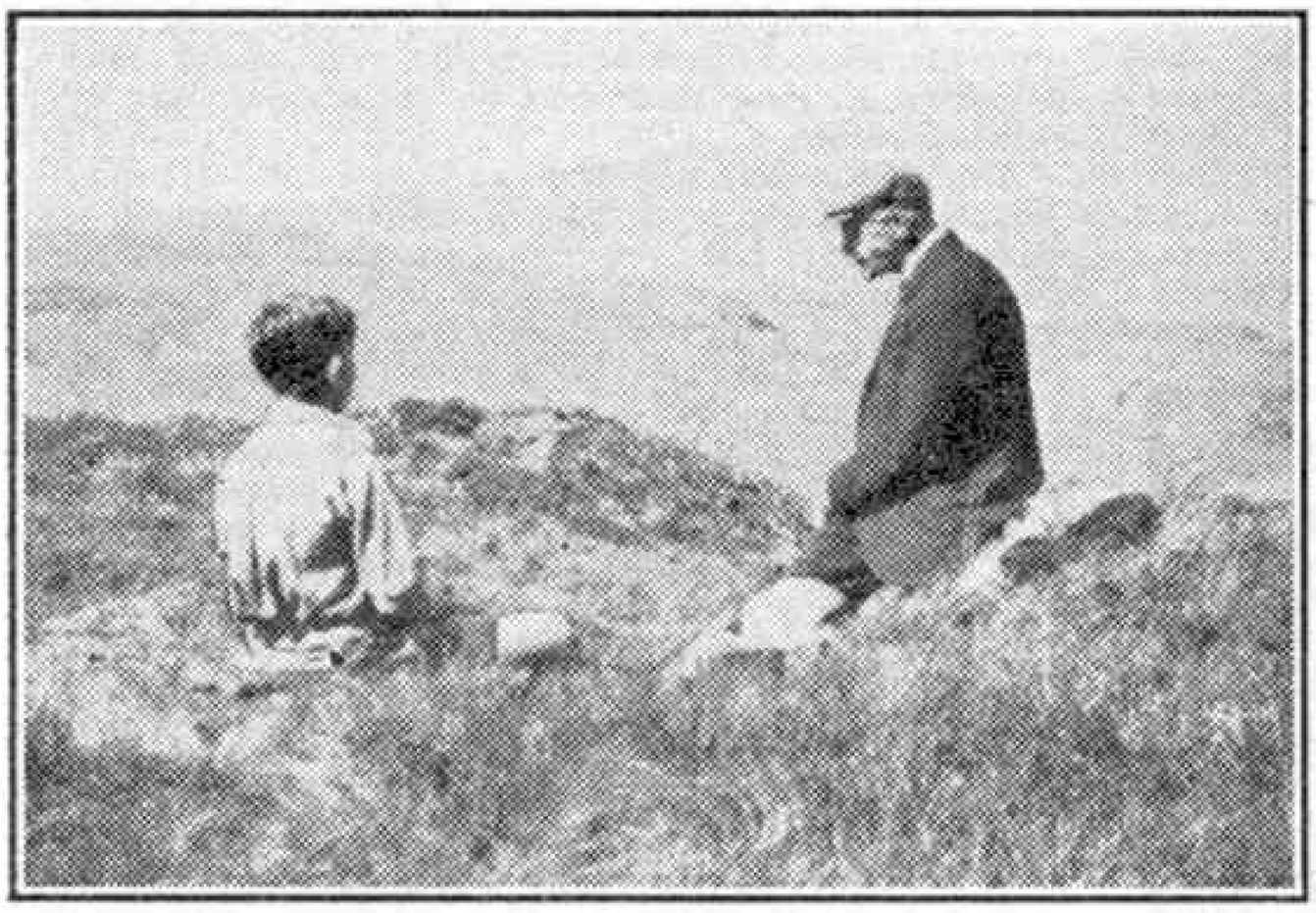
Last year my father and I had the privilege of climbing Cader Idris with an old gentleman who was making his 500th ascent of this grand rocky mountain, 2,929 ft. high, on the south side of the well known Barmouth Estuary. He was Mr. Brown, who was 75 years of age at the time. He set a steady pace up the Aran Glen alongside a brawling mountain torrent, and I was soon dragging behind. Our first objective was the Gau Graig ridge, the eastern end of the Cader Idris range, and then we were to follow the ridge to Pen-y-Gader, the highest summit. When we stopped for lunch before reaching the ridge my father took the photograph of Mr. Brown and myself that is reproduced here. Then over bog and heather we went, up among the bilberry-covered rocks, and at last reached the ridge. From here onward the views were wonderful.

Soon we were approaching the great mass of Mynydd Moel, the second highest point of the range. There was another long tiring climb for me here, but it was eventually completed and we were now 2,800 ft. above sea level. The Barmouth Estuary was spread out below us, and away to the north Snowdon stood out unchallenged above a score of other heights.

Next we made our way over the rock-strewn plateau towards the last rise. We approached the edge of the great northern precipice to take a look down the notorious Foxes Path, 900 ft. of loose scree that leads down to Llyn-y-Gader, a lake of incredible depth.

We reached the summit cairn at last, 4 hours after leaving Dolgelly, and how pleased I was to take a well-earned rest in the roofless portion of the hut! My father made a short speech in order to mark the occasion and Mr. Brown was congratulated by the people who gathered when the news went round that he had completed his 500th ascent. I bought a Cader Idris badge from Mr. Jones, the hut attendant, and had my photograph taken sitting on the trigonometrical pillar which is right on the top of the summit cairn. The descent of the steep slopes and the long walk and bus ride back to Barmouth brought to a close a day that I shall always remember.

DENNIS COLEMAN (Leicester).



A veteran climber on his 500th ascent of Cader Idris, with an "M.M." reader making his first climb. Photograph by H. A. Coleman.

Competitions! Open To All Readers

Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

What Happens on the Footplate

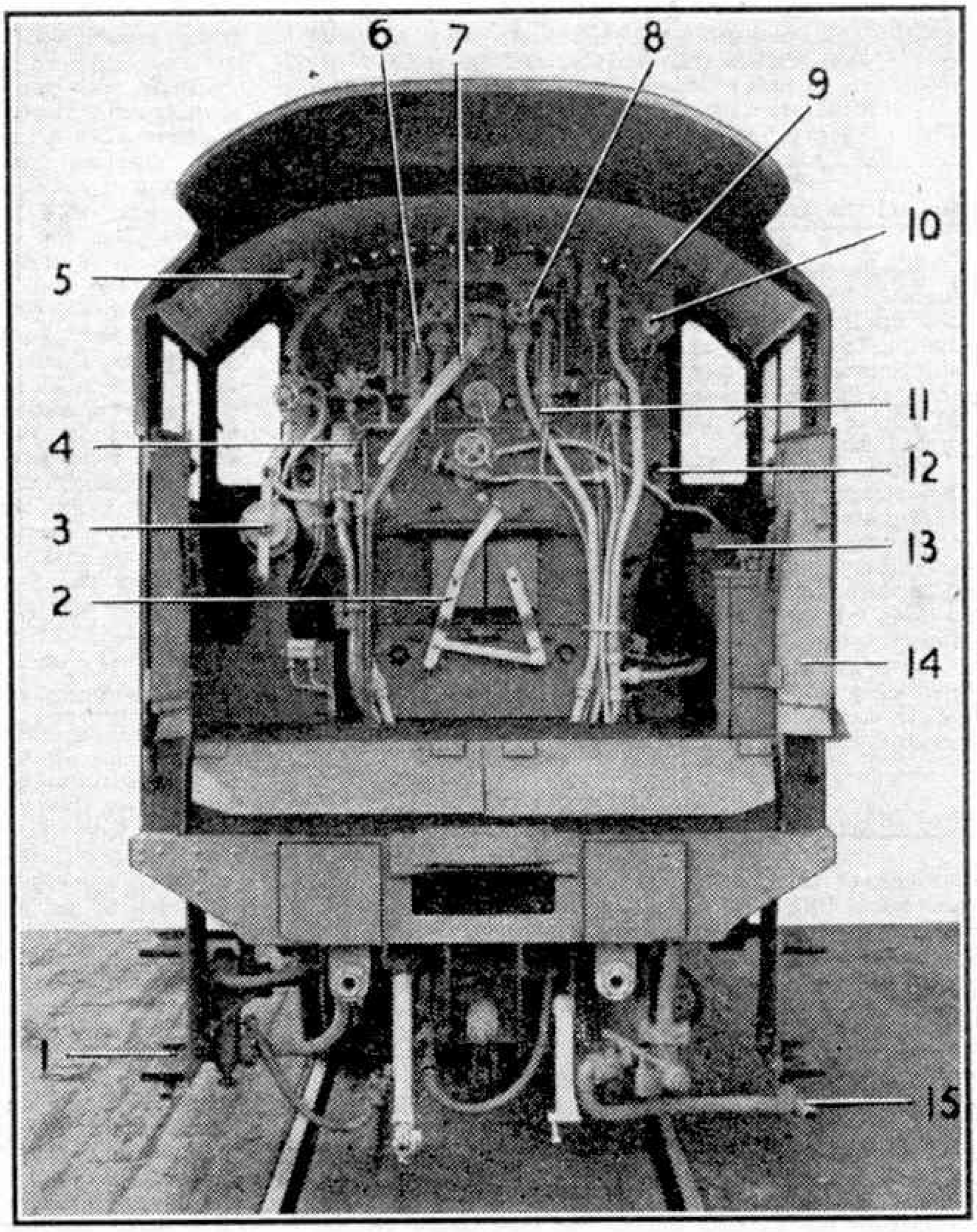
Practically all our readers, whether they are definite railway enthusiasts or not, are familiar with some, if not all, of the controls and fittings in the cab of a steam locomotive. We are therefore giving them an opportunity to win a prize through their knowledge.

The illustration on this page shows the footplate of a London Midland Region class "5" 4–6–0 locomotive, a type familiar in many parts of the country. Various fittings are indicated by numbers, and competitors are asked to name each of these and to give a brief description of its particular function. We are sure that readers will find this an interesting and pleasant diversion.

Entries should be written on one side of the paper only. They should list the parts in numerical order, but any reader who wishes to make his entry more pointed and more attractive than a straight list can do so, as in the event of a tie the judges will take the neatness and novelty of the entries into consideration in making final decisions.

The Competition is divided into the usual two sections, for Home and Overseas readers respectively, and in each there will be prizes to the value of 21/–, 15/– and 10/6 for the best solutions in order of merit. There will also be a number of consolation prizes.

Entries must be addressed *"June Locomotive Contest, Meccano Magazine, Binns Road, Liverpool 13."* Closing dates: Home Section, 31st July; Overseas Section, 31st October.



June Photographic Contest

In the 6th of our 1950 series of photographic contests readers are asked to submit woodland, garden or flower photographs. Figures can be included if desired.

The only conditions in this contest are 1, that the photograph must have been taken by the competitor, and 2, that on the back of the print must be stated exactly what the photograph represents. A fancy title may be added if desired.

The competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate sections for overseas readers, and in each section prizes of 21/–, 15/– and 10/6 will be awarded.

Entries should be addressed *"June Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13."* Closing dates: Home Section, 30th June; Overseas Section, 30th September.

Trade with China—(*Continued from page 244*)

22 knots, which was far bigger and faster than anything which had been considered. The renewal of the civil war and the downward sweep of the Northern forces to the borders of Hong Kong, capturing port after port but not having the warships to prevent the blockade maintained by the Southern Navy, altered the whole picture.

What the future will be is a matter of uncertainty, but those who know the Chinese best are generally optimistic that their desire for trade will overcome political considerations. The Chinese want so many things that Britain can supply, and in spite of the war have so many others that they want to export.

The illustrations to this article are by the Nautical Photo Agency.

Behind the Weather Forecasts—

(*Continued from page 250*)

These, then, are the chief sources of the "raw material" which the experts at Dunstable make into the familiar daily forecasts of fine or rain, fog or gale. Apart from the ships and aircraft, balloons and detectors, valuable reports are also received from such people as coastguards and lighthouse-keepers, who have special opportunities for studying changes in the weather.

When the forecasts have been made, they are despatched from Dunstable by teleprinter to the headquarters of the B.B.C., the Air Ministry and other authorities. The special forecasts for flying operations are similar to those given generally except that they contain more detail and refer to shorter periods. These are broadcast by radio-telephony at hourly intervals throughout the day. Gale warnings to shipping around the British coasts are sent immediately for transmission by radio from coastal signal stations or by teleprinter to the B.B.C., whose programmes are often interrupted to broadcast them.

Post Office versus Woodpecker—

(*Continued from page 251*)

throughout the country are now treated in this way, and the G.P.O. hope for complete immunity from the depredations of woodpeckers.

It is a little too early yet to judge what the final result in the struggle will be, but it is possible that the birds will again make themselves a serious nuisance on telegraph poles. As is well known, green woodpeckers have been increasing over most of the country for many years past, and this fact, along with the dwindling of the numbers of suitable rotten trees as nesting-sites, may account for their growing fondness for Post Office property. After all, telegraph poles were trees once, and the woodpeckers prefer dead timber anyway.

Outside the nesting season the two larger species of woodpeckers may often be seen searching for insects on telegraph poles. The lack of bark does not appear to handicap their progress up the poles, nor does the original creosoting appear to keep away the smaller insects so much sought after by these interesting birds.

Greater spotted woodpeckers also do a certain amount of damage to the poles, although their borings are considerably smaller in diameter and extent. There have been no complaints as yet against the lesser spotted woodpecker.

Brock the Badger—(*Continued from page 259*)

essential for a pet badger to lie warm and dry. As a matter of passing interest on this topic, all the polar bear cubs born hitherto in the Zoo have died within a few days, most of them from pneumonia! The last cub born within recent months, however, is flourishing, owing very largely to the thick stack of straw which makes its home.

Modern Knights of the Road—

(*Continued from page 266*)

result of landslides or floods, and sending weather reports to A.A. offices, so that members' enquiries may be satisfied—these are still more ways in which the patrolmen help motorists.

On his yellow and black motor cycle combination outfit, the A.A. road patrolman is a national figure to-day, recognised by the British motorist and by the visitor to this country as a guide, philosopher and friend. The legend written on the wall in the Camden Town instruction school admirably sums up the service. It reads: "You have inherited a proud tradition. You must uphold it." It is a tradition based on a careful study of motorists' needs, followed by intensive efforts to meet them.

In catering for drivers' requirements, as in providing a roadside repair service, the A.A. is not easily put off. When the Association wished to expand after the war, it was found that permanent premises were difficult to obtain in many localities. The problem has since been solved by introducing mobile roadside offices.

These take the form of a caravan designed and equipped as an office and reception room, and examples are to be seen in various parts of the country. They have proved extremely useful, for not only have they helped to overcome the difficulty of acquiring premises, but they can be moved as required to popular touring centres and national events. They have even been shipped abroad at the height of the Continental touring season.

If you are interested in statistics, it may be worth adding that the A.A. now has over 800,000 members—a record—and that the road patrol services alone cost about £850,000 a year to maintain.

Engines of Title—(*Continued from page 271*)

of the bulldog rather than the greyhound. There was a similar air of North Country sturdiness about the beautifully-cast nameplates; solid, down-to-earth names like "*Sir Sam Fay*" or "*Charles Stuart Wortley*" were far removed from the poetry of "*Banshee*" or "*Cock o' the North.*" All the same, there was always something fascinatingly different about the G.C., even to the brass letters and numerals upon its coaches.

Few of the remaining British lines believed in naming their steeds; of these few, the North British section of the L.N.E.R. undoubtedly took premier place with their graceful Atlantics, "*Bonnie Dundee*," "*The Lord Provost*" and others—all attractively named. I used to think these big-boilered engines the epitome of power and speed as they stood, humming softly with suppressed energy, at Edinburgh Waverley, ready to pull out for Newcastle or Carlisle. The Scottish railways not unnaturally drew upon the rich store of names to be found in the novels of Sir Walter Scott; the North British did this in no uncertain fashion, particularly for the 4–4–0 types. Names alas, were painted upon the splashers, an economical habit that was also followed by the Highland Railway, which drew its titles mainly from the castles and lochs of its native country.

The named engines that gave me most joy in Scotland in those days of the early thirties, however, were the sturdy 0–6–0s of the N.B., by no means the most modern of their class, but apparently veterans of service in Flanders during the 1914–18 war. These maids of all work bore famous titles such as "*Mons*" and "*Old Bill.*"

THE MULTICRAFT PRECISION CUTTING TOOL

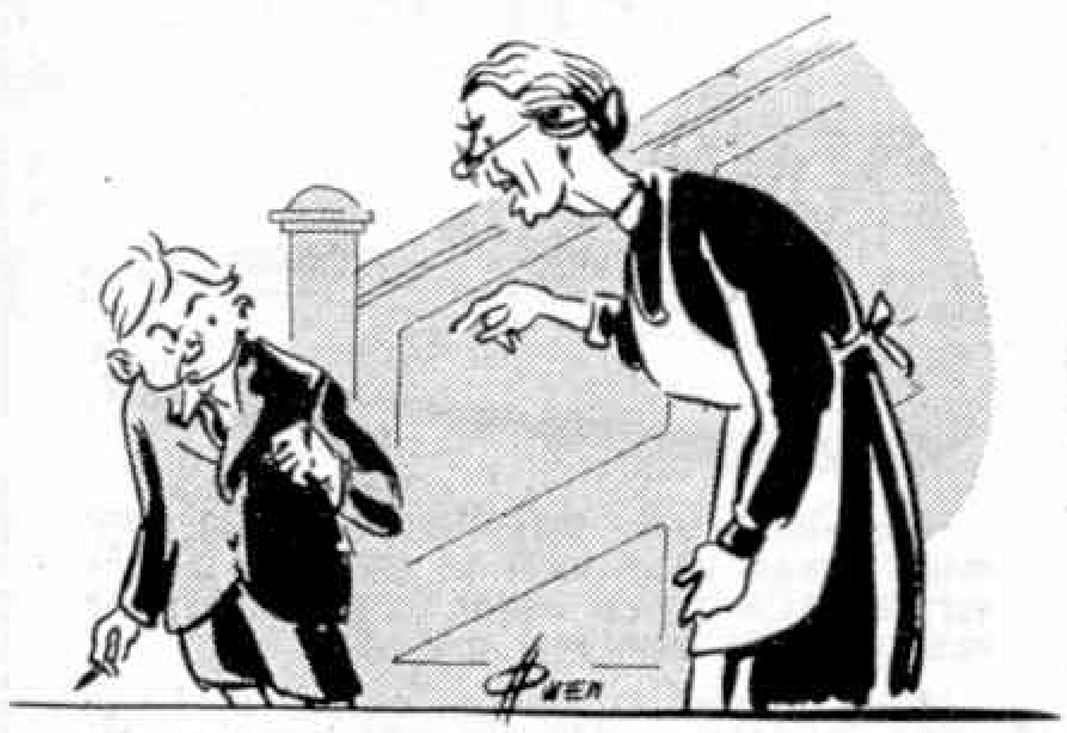
This handy tool, which resembles a fountain pen in appearance, will be found very useful by the craftsman, home handyman and hobbyist. Four steel blades are provided with it, and at one end is a simple chuck to hold them in use. The cost of the tool is 5/–. It is distributed by Phillips Omnipool Ltd., 29, Bolsover Street, London W.1.

Fireside Fun

"What struck you first when you went to the Museum, Jones?"

"The revolving door, sir."

* * * *



"What are you doing with those cigarettes, Willie?"

"Waiting till I'm old enough to smoke them, ma."

* * * *

"I'm first in Geography," boasted Smith.

"And I'm first in Arithmetic," bragged Jones.

"And I'm first in English," added Brown. "What have you done, Green?"

"Me? Oh, I'm first in the playground after school."

* * * *

Manager: "How long did you work in your last place?"

Applicant: "52 years, sir."

Manager: "But you told me you were 45 years old, so how could you have worked 52 years?"

Applicant: "Overtime, sir."

* * * *

"Yes, I enjoy watching people make fools of themselves. When all the fools are gone I shouldn't want to be here."

"Don't worry, you won't be."

* * * *

"Yes, he wanted to do really big things in the world until he joined the zoo."

"Why, what happened there?"

"They told him to wash the elephants and the hippos."

* * * *

"What kind of flowers do you grow in your garden?"

"Well, it all depends."

"Depends? What on?"

"On what kinds of seed I sow."

* * * *

"And when is the best time to gather the fruit, Tomkins?"

"When the dog's chained up, sir!"

BRAIN TEASERS

EVEN MONEY

In a market in the Far East a pear cost 5c., 20 grapes 1c. and an apple 1c. A purchaser bought 100 fruits and found that these cost exactly 100c. How many fruits of each kind did he buy? K.V.N.

* * * *

HOW LONG DOES THIS TAKE YOU?

Here is a puzzle of a different kind, into the solution of which the time element enters. How many times is 7½d. contained in £1,000,000? A long division sum would give you the answer, but see if you can find it more easily and in less than 15 seconds. It can be done.

* * * *

LOOK FOR THE EASY WAY

Time yourself also over this problem, which can be solved easily within 15 seconds.

The members of a club collected subscriptions for seasonal presents to the staff. Half the male members contributed 5/- each, and one-third of the lady members 7/6 each. The total number of members was 400. What sum of money was raised?

* * * *

SAME THERE AND BACK

NO TRADES SEES OPPOSED OPPOSITION; IS IT ART?. This sentence appears to be nonsense. The eight words in it can be re-arranged to make some sort of sense, however, and will then form what is called a palindrome, that is a sentence that reads the same forward or backward. Can you make a palindrome from these words?

Now try to make a palindrome of two a's, two e's, two m's, two o's and twice two n's. The sentence required has four words in it.

* * * *

"Could you see me across the road, officer?"

"Aye, I could see ye a mile away, sir!"

* * * *

SOLUTIONS TO LAST MONTH'S PUZZLES

The eight "lights" of our first puzzle last month were ALARM, MAGNA CARTA, EGG, CAMERA, CADIZ, ASSEGAI, NEON and OMELETTE. The "uprights" gave "A MECCANO MAGAZINE."

The number of pence in the takings on the three days of the Exhibition in our second puzzle were 888, 1,073 and 1,332 respectively. 1,073 can only be split up into the prime numbers 29 and 37, and of these only 37 will divide exactly into the other two. Therefore the charge for admission was 37 pence, or 3/1. The numbers of visitors on the three days were 24, 29 and 36, respectively.

The film titles of our third problem were "ROCKING HORSE WINNER," "MORNING DEPARTURE" and "BLUE LAMP."

This brings us to our cricket puzzle. Before the start of the match Smith had had 128 runs scored against him, while 32 runs had been scored against Brown.

BUILD YOUR "00" TRACK

PECO

Components enable you to plan and lay your track exactly as it is done in real practice. Gentle sweeping curves. Realistic ballast. Proper sleepers cut to length and accurately drilled to take the chairs. Fishplates to join the rails. Accurately machined Frogs with which you can build point work of any formation you wish.

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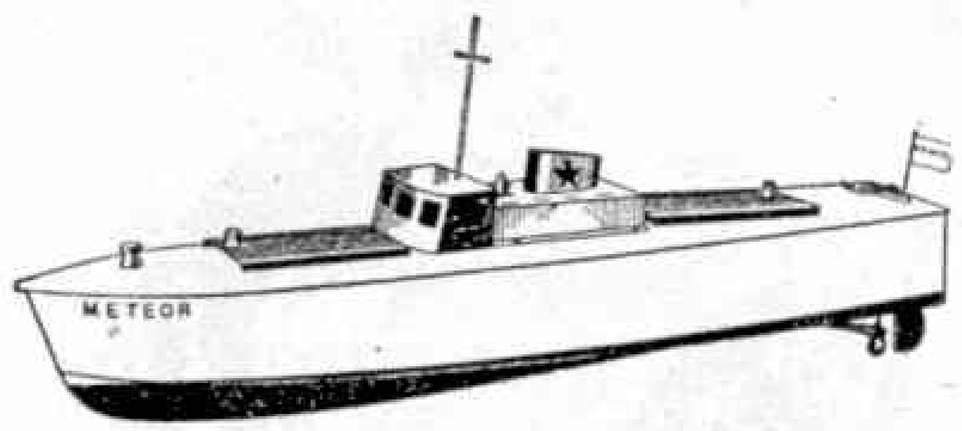

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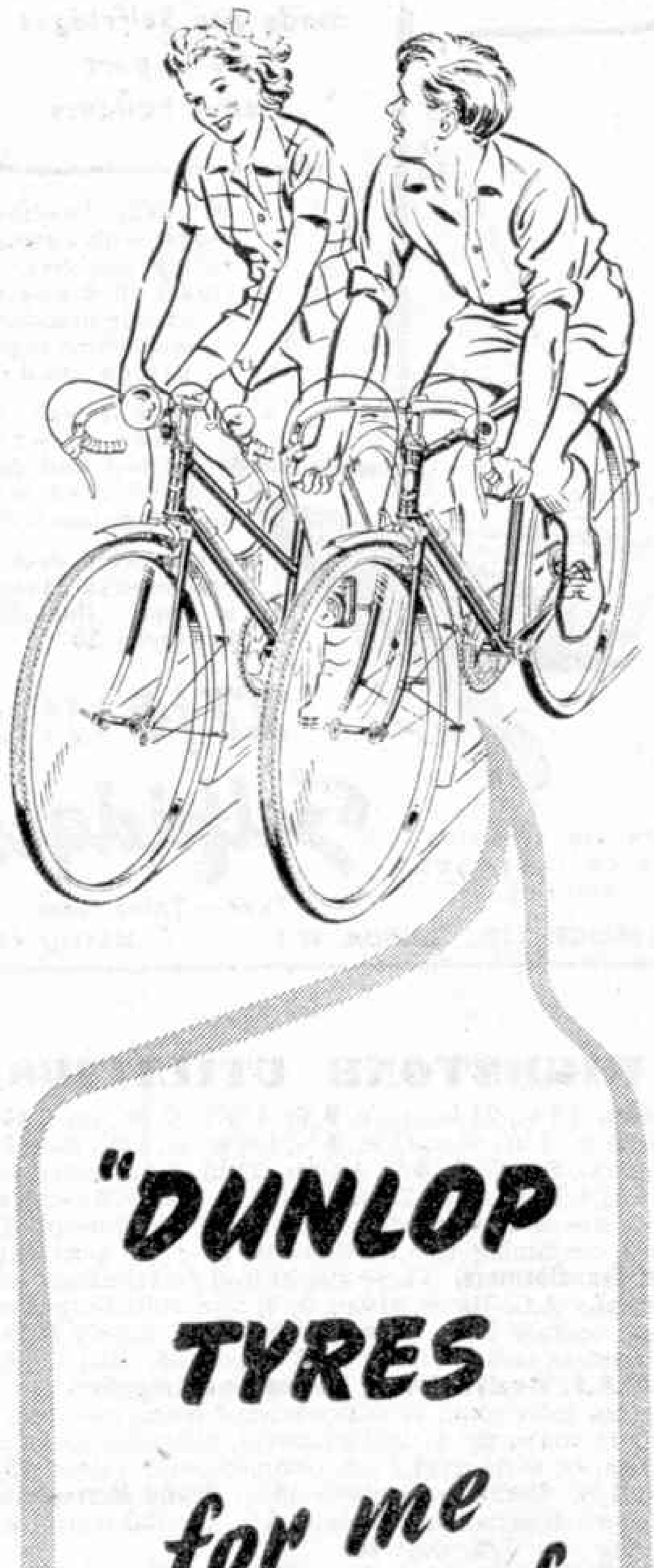

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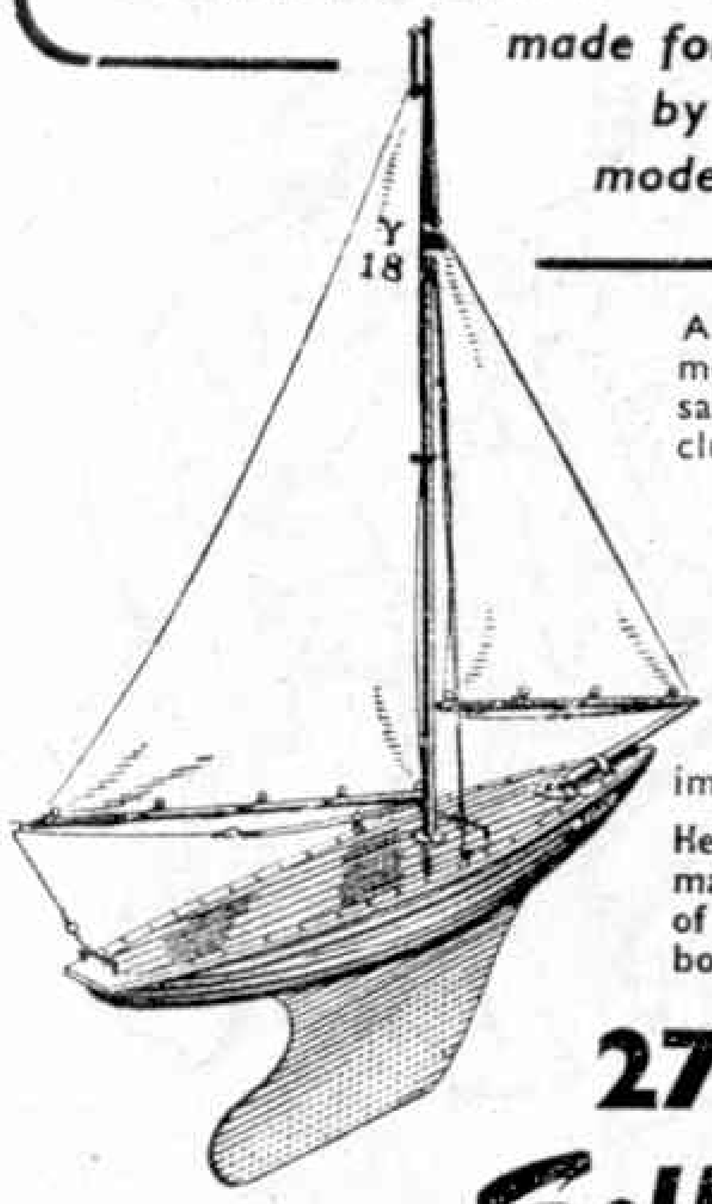

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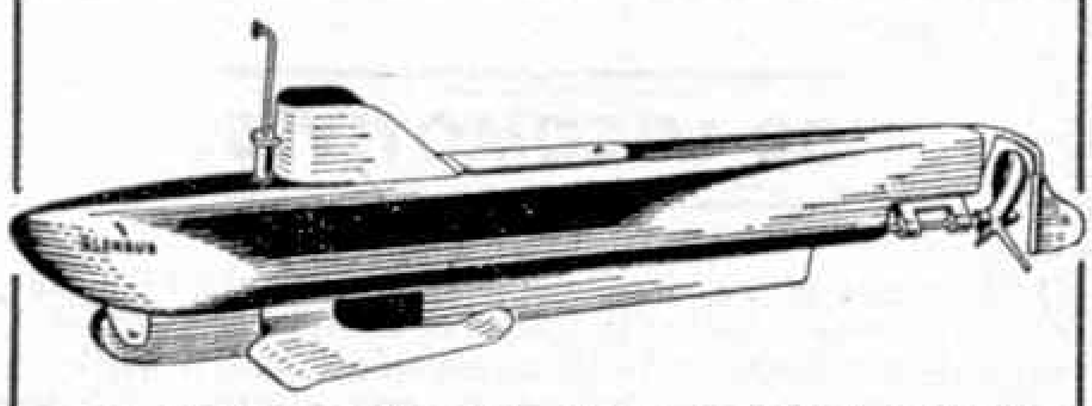

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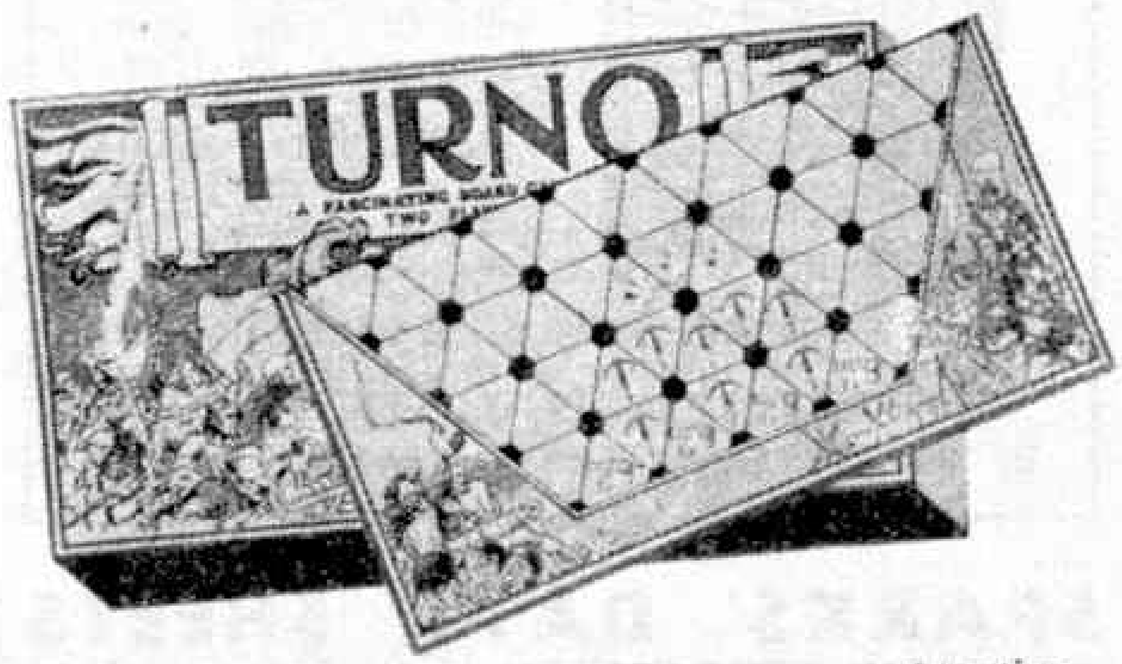

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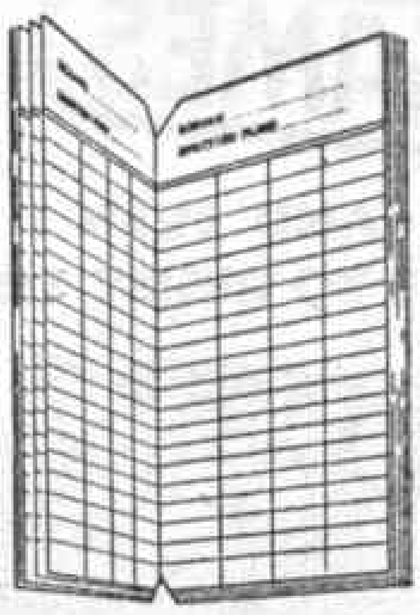

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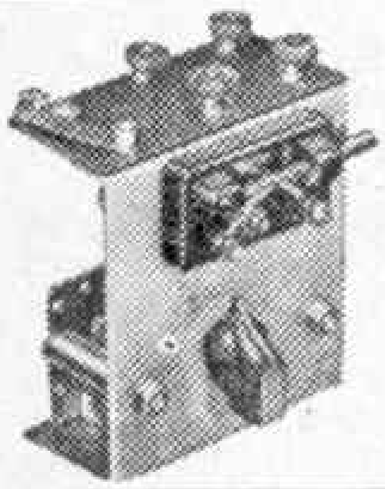

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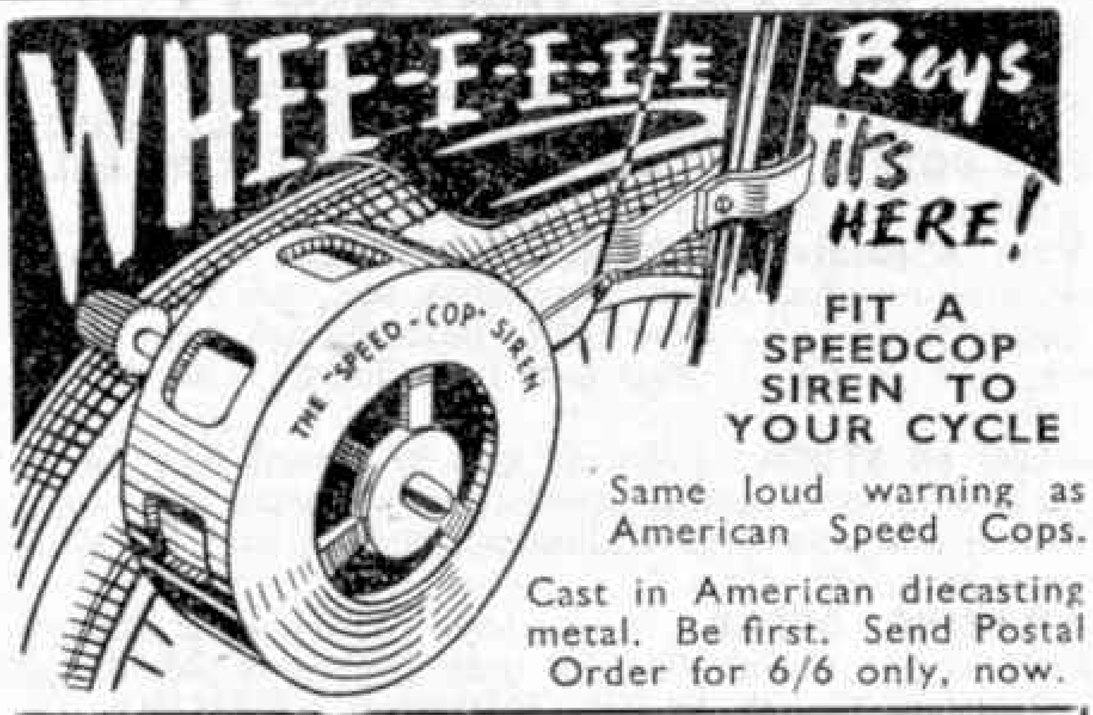

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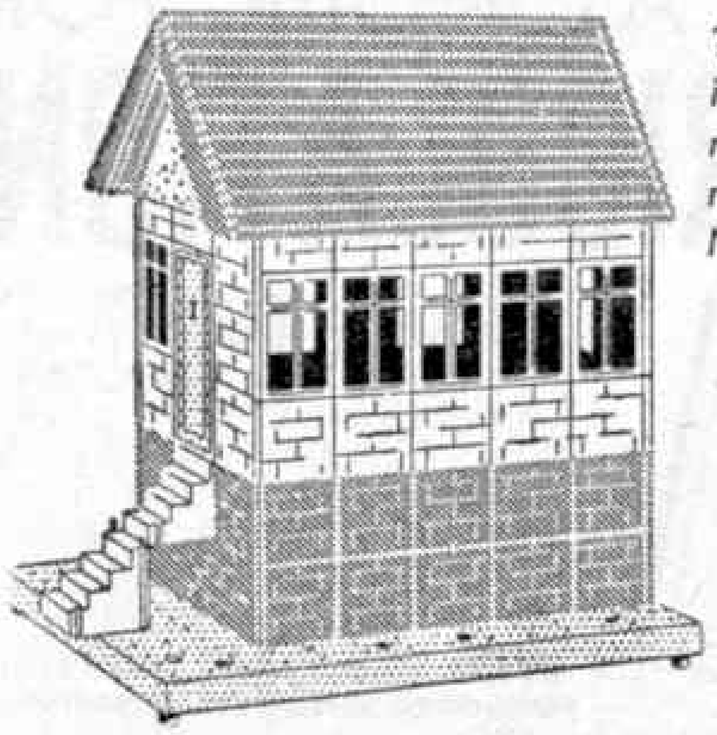

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